Biofuelwatch Response to the Scottish Consultation on the Review of Renewable Obligation banding levels, January 2012

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Dear Mr Rafferty

Re: Renewable Energy The Renewables Obligation (Scotland) Order 2011 Consultation on Review of ROC Bands October 2011

I write to you to on behalf of Biofuelwatch to submit our Response to the Consultation as it relates to ROCs for biomass and bioliquids.

Biofuelwatch is an independent organisation that works to raise awareness of the negative impacts of industrial bioenergy on biodiversity, human rights, food sovereignty and climate change. Based in UK and US, we work with national and international partners to expose and oppose the social and environmental damages resulting from bioenergy-driven increased demand for industrial agriculture and forestry monocultures.

Our position is that all financial support for large-scale solid biomass and bioliquid electricity should be withdrawn.

Any subsidies for biomass and bioliquids will continue to promote a rapid expansion of bioelectricity in Scotland.

The key reasons why we are opposed to the bioenergy industry, be it in the form of dedicated electricity-only power stations, CHP power stations, or co-fired power stations, are summarised as follows:

1. ***Increased carbon emissions:*** In contrast to other renewables like wind and solar, biomass and bioliquids electricity produce large amounts of carbon from combustion, processing, transport and land use change. Taking into account all of these factors, biomass and bioliquids are more carbon intensive than the fossil fuels they seek to replace. As such, the large-scale use of bioelectricity will not help Scotland decarbonise its electricity sector and deliver the reductions in greenhouse gas emissions urgently needed to avoid irreversible and catastrophic climate change.

2. ***Unsustainable demand and impacts on forests:*** Due to unprecedented demand, directly and indirectly, the bioenergy industry threatens to lead to tree plantation expansion and more destructive logging, much of it in the global

South. Biomass and bioliquids are not 'renewable' because they require land to be dedicated for decades to growing energy crops, taking land out of use for growing food and increasing the pressure on global biodiversity. The overwhelming majority of wood to be burnt in converted and dedicated new-build power stations would be imported. The production of biomass and bioliquids overseas is associated with human rights abuses, land grabs, deforestation of tropical, temperate and boreal forests, malnutrition, and soil and water pollution. These environmental and humanitarian impacts are therefore exported and are not discussed in Power Stations' Impact Assessments.

3. ***Human rights and sustainability criteria:*** The sustainability criteria for biomass and bioliquids fail to address some of the most serious adverse direct effects of bioenergy use, namely, human rights abuses. But more importantly, sustainability criteria will never ensure true respect for the environment and human rights. This is because sustainability criteria cannot tackle the root cause of the problem: the unprecedented scale of the demand for land, with its associated indirect and direct impacts on forests, land rights, and the right to food.
4. ***Inefficiency:*** Biomass power generation is an inefficient process, with commonly 75% of the energy available in the biomass being wasted as heat. This figure does not account for the energy required for example to turn process wood into pellets. We note with concern that CHP Biomass still allows for an inefficient use of biomass.

Before answering the specific Consultation questions on biomass, we outline our four concerns in further detail, because they are of cross-application to all of the Consultation questions.

1. Carbon emissions

The banding of support for renewable energy technologies does not recognise the widely varying contribution various technologies make to reducing carbon emissions. Solid biomass electricity continues to be deemed 'renewable', even up to a carbon intensity of 285 kg CO2e per MWh (UK RO). Bioliquid electricity is deemed 'renewable' up to 463 kg CO2e per MWh (EU RED assuming a 25% conversion efficiency, and a 35% threshold). These high levels of carbon intensity are orders of magnitude greater than non-combustion renewable energy technologies.

The position would be even worse if the official methodology used to calculate the carbon intensity did not erroneously ignore important carbon factors.

The factors which have been ignored as part of the official methodology to quantify carbon emissions from biomass include (1) the Carbon Debt incurred from harvesting feedstocks and (2) emissions incurred from Indirect Land Use Change. A full consideration of the carbon impacts of industrial biomass and bioliquids shows them to be more carbon intensive than the fossil fuels they seek to replace, and demonstrates that they will accelerate rather than slow down climate change.

As a result, the requirement for biomass to achieve greenhouse gas emissions savings of 60% as required by the introduction of sustainability criteria is a false target.

(a) The Carbon Debt From Burning Biomass

Two important reports published in 2010 and commented on below should inform the UK's use of biomass for energy. Both show that it is erroneous to ignore the temporal

aspect of so-called carbon-neutrality. In essence, they dismiss the idea that GHG emissions from burning biomass today can be immediately written down to zero because in time those emissions will be absorbed by future growth. There are in fact no guarantees that today's emissions from bioenergy will be cancelled out by future sequestration which would anyway need to be additional to allow the biomass emissions to be honestly written off.

The crucial mistake with writing down today's biomass emissions to zero is to ignore the imperative need to reduce actual emissions in the next few years, not just hope they will be absorbed at a later time and in other countries or proceed on the basis that sequestration in the future is as effective as reductions today.

The Scottish Government's proposed sustainability criteria do not require that adequate re-planting is undertaken to ensure that current biomass emissions are sequestered in the future, and in adequate time. There is just a reliance on the market to ensure that such replanting occurs. This is a very risky policy.

As well as these two studies, the Scientific Committee of the European Environment Agency issued a written opinion on 15th September 2011 which strongly supports those concerns. They warn:

> 'The potential consequences of this bioenergy accounting error are immense. Based on the assumption that all burning of biomass would not add carbon to the air, several reports have suggested that bioenergy could or should provide 20% to 50% of the world's energy needs in coming decades. Doing so would require doubling or tripling the total amount of plant material currently harvested from the planet's land. Such an increase in harvested material would compete with other needs, such as providing food for a growing population, and would place enormous pressures on the Earth's land-based ecosystems. Indeed, current harvests, while immensely valuable for human well-being, have already caused enormous loss of habitat by affecting perhaps 75% of the world's ice- and desert-free land, depleting water supplies, and releasing large quantities of carbon into the air.' [1]

The Scottish Government's proposes sustainability criteria for biomass ignore the carbon debt of biomass and all land-based emissions, based on the false assumption that those are 'taken care of' by certification schemes which certify wood even from old-growth forest logging and from ecosystem and farmland conversion to monoculture tree plantations.

The Manomet Centre for Conservation Sciences, Massachusetts, published 'Biomass Sustainability and Carbon Policy' in June 2010. Their study assessed varying rates by which regrowing forests repays the carbon debt incurred by their removal and combustion, and found that burning biomass emits more greenhouse gases than fossil fuels:

> 'Forest biomass generally emits more greenhouse gases than fossil fuels per unit of energy produced. We define these excess emissions as the biomass carbon debt. Over time, however, re-growth of the harvested forest removes this carbon from the atmosphere, reducing the carbon debt.'[2]

Manomet estimated the size of the biomass carbon debt for different situations: if biomass electricity is used to replace electricity generated by natural gas the time to

[1] European Environment Agency Scientific Committee, 'Opinion of the EEA Scientific Committee on Greenhouse Gas Accounting in Relation to Bioenergy' (15 September 2010), www.eea.europa.eu/about-us/governance/scientific-committee/sc-opinions/opinions-on-scientific-issues/sc-opinion-on-greenhouse-gas, p. 1

[2] Manomet Center for Conservation Sciences, 'Biomass Sustainability and Carbon Policy Study' (June 2010), http://www.manomet.org/sites/manomet.org/files/Manomet_Biomass_Report_Full_LoRez.pdf, p. 6

repay the carbon debt is likely to be over 90 years; if it is displacing electricity generated by coal the repayment period over 40 years. Those figures are based on the assumptions that no forests will be logged that are not being logged for timber already and that no land will be converted to new plantations. They are therefore highly conservative (if the electricity generation being displaced was from wind, marine and solar, or from CCS-equipped fossil fuel generation, the biomass carbon debt period would be even longer).

The Manomet report concludes: 'So, over a long period of time, biomass harvests have an opportunity to recover a large portion of the carbon volume removed during the harvest. However, this assumes no future harvests in the stand as well as an absence of any significant disturbance event. Both are unlikely.'[3]

In their May 2010 report, '*The Upfront Carbon Debt of Bioenergy*', Joanneum Research state that the key aspect of sustainability with regard to biomass is whether or not terrestrial carbon stocks are maintained or improved:

> 'GHG sustainability in the case of biomass is, essentially, a question of maintenance of carbon stocks. Except for biomass converted to extremely recalcitrant forms (e.g., fossil fuels or recalcitrant soil carbon), biomass oxidizes sooner or later, regardless of whether humans intervene or not. Thus, maintenance of carbon stocks entails sufficient biomass growth, over some time period and spatial area, to 'make up for' biomass oxidized. Requirements for biofuels to meet sustainability criteria consequently represent imposing responsibility for regrowth of biomass, e.g. for what occurs at the first step in a biofuel's value chain – its cultivation.'[4]

They go on to note: 'Globally, as has been the case at least since 1860 (Schlamadinger and Marland 2000), there is a net loss of terrestrial carbon stocks'[5]

Joanneum Research point out that the GHG saving methodology used for the EU Renewable Energy Directive ('RED') does not account correctly for the use of woody biomass from existing forests/ plantations, because its time horizon for direct land use change is too short:

> 'To be eligible for compliance with the [RED], a biofuel consignment's GHG profile must be calculated. Emissions due to cultivation of biomass, direct land-use change, conversion to a fuel, and transportation must be included. No attempt is made to include emissions due to indirect land use change at this time. …Emissions from direct land use change must be annualised over 20 years. This is a sufficiently short time frame so that biomass grown on land converted from forests, wetlands or recently drained peatlands would generally fail to meet the criteria as long as actual emissions are used. However, this method of calculating GHG emissions does not address the problem of emissions from extraction of biomass where lands remain in the same land use. In particular, the formula does not address emissions due to increased extraction of wood from forests already used for wood supply. As shown in Section 4, the 'value' of such biomass from the perspective of its contribution to reductions in GHG emissions within the time frame relevant to the RES, e.g., the 2020 targets can vary greatly. Use of wood for energy from forests already in use is more likely to occur in the case of use of biomass for heat and power than for biomass for biofuels, at least in the near- to medium-term.'[6]

Joanneum assess the carbon debt of different sources of woody biomass to replace non-biomass electricity generation, and conclude:[7]

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[3] Ibid., p. 86
[4] Joanneum Research, 'The upfront carbon debt of bioenergy' (May 2010) http://www.birdlife.org/eu/pdfs/Bioenergy_Joanneum_Research.pdf , p. 41
[5] Ibid., p. 42
[6] Ibid., p. 40
[7] Ibid., pp. 21-29

4.1.1 Residues from managed forests

When harvest residues, previously left on the forest floor, are extracted for bioenergy, there is a carbon stock loss in the dead wood, litter and soil pools. It was estimated that the mitigation potential of such bioenergy material in a 20 year time horizon is reduced by 10-40% by this loss (CN=0.6-0.9).

4.1.2 Additional fellings from managed forests

It was assessed that additional fellings for bioenergy can produce a decrease of the overall C stock in the forest that significantly affects the GHG balance of the bioenergy material. In the short-medium term (20-50 years), additional fellings could produce more emissions in the atmosphere than a fossil fuel system (CN<0). In such a case, the use of additional fellings would produce only very long term benefits, in the order of magnitude of 2-3 centuries.

4.1.3 Bioenergy from new plantations

The GHG balance of biomass from new plantations should include the C stock change due to the conversion from the previous land use (direct and indirect). The biomass source can be carbon neutral when the C stock change is zero or positive (e.g. conversion from abandoned croplands). If there is an initial carbon loss (e.g. conversion from a forest area), the biomass will produce an atmospheric benefit only after that the C stock change is fully compensated by the amount of avoided emissions in replaced fossil fuels.

Joanneum's findings show that the carbon debt from woody biomass can be as long as 300 years, but varies significantly depending on the source and previous land use. It is clearly an over simplification for the sustainability and carbon saving criteria to be applied uniformly across all types of wood fuel. And of course to ignore the carbon debt altogether.

There was and still is often the claim that "young trees sequester more" as an attempt to justify cutting old growth forest and replacing with plantations. The US Centre for Biological Diversity (CBD)[8] has addressed this mistaken view:

"Contrary to popular belief, young forests do not have the highest carbon sequestration rates or net ecosystem productivity. In fact, Law et al. (2003) examined the variation in productivity and sequestration according to stand age. Net ecosystem productivity was actually the lowest in the initiation stands (9-23 years), moderate in young stands (56-89 years), highest in mature stands (95-106 years) and trended downward in the oldest stands (190-216 years), but was still greater than the youngest stands (Figure 4).

Law et al. (2003) also found that the old stands had the highest level of carbon storage in live mass by age 200 and it did not decline after that (mean 17.6 kg Cm -2). Overall ecosystem carbon storage increased rapidly until 150-200 years and did not decline in older stands (Law et al. 2003).

These findings are not new and appear to have been ignored by policy that is encouraging such rapid and uncapped expansion of bio-energy use in the UK - which can only realistically be achieved through massive new tree plantings, in turn enabled by massive clear-cutting.

Finally, in the context of Scottish research on this, we refer the Scottish Government to recent research by Robert Matthews et al[9] exploring and measuring the Greenhouse Gas emissions associated with different end uses of wood. The study confirms that the best use of timber is for traditional wood products and the worst possible use is as biomass fuel in terms of carbon savings alone.

[8] Centre for Biological Diversity, see http://www.biologicaldiversity.org/

[9] Matthews, Mortimer, Evans, Hatto, Mwabonje, Mackie, Randle, Rolls, Tubby (2011) **Biomass Research in Support of the Renewable Obligation (Scotland) consultation Part 1: Best Use of Wood Fibre**
http://www.forestry.gov.uk/pdf/RobertMatthews20Dec2011.ppt/$FILE/RobertMatthews20Dec2011.ppt

(b) Emissions incurred as a result of Indirect Land Use Change

The sustainability criteria require that biomass does not come from primary forests, but they do not take into account any Indirect Land Use Change (ILUC) impacts that biomass might have; i.e. the fact that high demand for land to source biomass and bioliquids displaces existing users of land into forests and other high value land ecosystems.

In 2008, the seminal Searchinger Report contained in *Science* Journal explained the impacts of ILUC in respect of biofuels in the transport sector:

'Because emissions from Indirect Land Use Change are likely to occur indirectly, proposed environmental criteria that focus only on direct land use change would have little effect. Barring biofuels produced directly on forest or grassland would encourage biofuel processors to rely on existing croplands, but farmers would replace crops by ploughing up new lands.'[10]

As far back as 2008, in respect of the Renewable Transport Fuel Obligation and biofuels for use in the transport sector, the UK Government was critical of that fact that ILUC factors were not taken into consideration. The Gallagher Review found, 'At EU level, targets within the Renewable Energy Directive and Fuel Quality Directive should recognise the need to avoid both direct and indirect land use change that leads to significant loss of carbon stocks.'[11] It continued, 'Based on [the evidence surrounding the carbon impacts of Indirect Land Use Change] the RFA believe it would be unwise to proceed with the introduction of biofuels in the manner, or at the pace presently envisaged.'

It appears to be a step backwards that these considerations, whilst originally raised in the context of biofuels in the transport sector, appear to have fallen by the wayside in respect of bioliquids and biomass in the electricity sector, which uses the same lifecycle analysis to quantify emissions as the heavily criticised biofuels LCA.

2. ROCs for electricity-only biomass, CHP biomass and co-fired biomass will lead to unsustainable demand, with devastating and irreversible impacts on the environment and human rights

The scale of demand for biomass will soon exceed domestic supply. This will lead to deforestation and land use change resulting in further greenhouse gas emissions, human rights abuses, and biodiversity loss (as well as an increase in timber prices, which will make it harder for small community initiatives using small-scale biomass to compete)

(a) Scottish demand for biomass exceeds supply by five times

In its March 2011 Update Report to Scottish Ministers, the Wood Fuel Task Force 2 projected that wood availability in addition to existing market consumption was as follows:[12]

Current: 432,400 ODT

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[10] Searchinger et al, 'Use of US Croplands for Biofuels Increases Greenhouse Gases Through Emissions from Land-Use Change' (29 February 2008) 319(5867) *Science* 1238

[11] Report of the Renewable Fuels Agency: 'The Gallagher Review of the Indirect Effects of Biofuels Production' (July 2008), p 8

[12] Wood Fuel Task Force 2, 'The Supply Of Wood For Renewable Energy Production In Scotland' (March 2011), available at http://www.forestryscotland.com/media/142731/woodfueltaskforceupdatereport_2011.pdf, p 31

2012-2016: 867,100 ODT

2017 – 2021: 1,183,700 ODT

Note that the WFTF2 figures on wood availability reflect the amount total available surplus wood for use *across all industries* – not just the amount that would be available for the energy sector. It also includes wood fibre from waste.

The proposed new biomass power stations in Scotland that are not yet in operation would, if all were granted planning permission, require 5,428,800 tonnes of wood (ODT) per year, as shown in Table 1. That is **roughly five times the amount of wood that is available domestically for use across all industries and runs clearly counter to the Government's own stated policy of biomass on an appropriate scale.**

Table 1 (on the following page) illustrates that of the proposed biomass power stations in Scotland, the majority classify themselves as co-fired power stations or CHP biomass power stations (It shall be shown below that power stations in the UK and Scotland can be eligible for the higher CHP Biomass subsidy achieving efficiency levels of as low as 35%). **This demonstrates that cutting ROCs for electricity-only biomass power stations will not give effect to the Scottish Government's commitment to using biomass on a scale appropriate to supply unless ROCs are cut across the board for co-fired biomass and CHP biomass.**

(b) **<u>The effect of demand on the global timber markets</u>**

The proposed expansion of biomass usage should be seen in the context of the global market for timber. The UNECE reported in August 2010:

> 'The only segment of the [wood] market that grew in 2009 was wood used for energy... Government policies to mitigate climate change and to improve energy security boosted renewable energy sources, of which wood is the key component. In the European Union, wood accounts for more than 50% of renewable energy sources. Incentives to promote wood energy have intensified competition for wood supplies. Demand for wood began to increase in early 2010, and in combination with the record low harvests, roundwood prices rose.
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> 'Forest products markets are now global, as illustrated by China's meteoric rise over the past decade to become a major producer, consumer and trader of wood and paper products. China has competed successfully on price and quality to seize market share from former leaders, such as Italy for furniture. However, to take advantage of lower manufacturing costs and to maintain competitiveness, UNECE region companies are now increasingly investing in production facilities in other countries in southeast Asia and South America.'

In simple terms, there is already a global land grab to secure future supplies of wood for both construction and furniture and for energy. A UK and Scottish biomass strategy reliant on a near doubling of global wood pellet and woodchip production in the next few years will only exacerbate this, with all the consequential sustainability impacts and uncertainties.

As Europe and the UK use an ever-greater proportion of their own wood for bioenergy, wood imports for other markets increase. The direct and indirect impacts on land-use change, biodiversity and climate are likely to be similarly deleterious as those of bioliquid fuels, with the additional likelihood of greater forest degradation.

Table 1: Current Proposed Biomass Power Stations in Scotland

Proposed Biomass Power Stations in Scotland	Developer	Status	MW	Estimated tonnage of biomass required (ODT)[13]	Type of power station that the developer classifies itself as[14]
Rothes, Morayshire	Helius	Approved	7.2	46,800	CHP
Grangemouth	Forth Energy	In Planning	100	650,000	CHP
Hunterston (co-firing)	Ayrshire Power	In Planning	240	1,560,000	Co-firing
Rosyth	Forth Energy	In Planning	100	650,000	CHP
Leith	Forth Energy	In Planning	200	1,300,000	CHP
Dundee	Forth Energy	In Planning	100	650,000	CHP
Fort William Biomass Plant	Peel Energy	Proposed	18	117,000	CHP
Longannet	Scottish Power	Proposed	25	162,500	Electricity only
Tullis Russell, Markinch, Fife	RWE	Under construction	45	292,500	CHP
				Total tonnage (ODT) required: 5,428,800	

(c) **<u>Increased logging to supply new biomass demand</u>**

In many parts of Scandinavia, old growth forest logging and other highly destructive logging has been documented and appears to be accelerating, due to attempts to 'harvest' ever more wood, not least for bioenergy. A letter signed by over 200 scientists worldwide as well as by thousands of individuals and many groups warns against the destruction of the last of Sweden's old growth forests and states: 'The Swedish Government and the Swedish Forest Industries Federation advocate further forestry intensification, with methods such as stump extraction, increased use of non-native tree

[13] These figures have been calculated based on figures provided by Xero Energy Ltd's calculations, drawn from figures provided to it by the Biomass Energy Centre, which suggest that electricity only biomass plants require approximately 6,500 ODT per MW.

[14] Note that Biofuelwatch does not agree that developers can classify themselves as 'CHP Biomass' where power stations over 25MW achieve efficiency levels of under 70%, in accordance with EU Guidance on this contained in Art 12(2) Cogeneration Directive. However, we illustrate that due to a loophole in how ROCs apply to CHP, developers can meet eligibility for ROCs under the CHP banding even where they achieve low efficiency levels.

species, restoration of ditches, and fertilization, which threaten the biodiversity even more.' [15]

In 2007 an Open Letter against the destruction of old growth forests in Northern Finland was signed by 257 researchers who said*:* '...it can be reasonably stated that logging of natural forests causes irreversible change of habitat, and destroys an important part of our national heritage as well as genetic and species diversity. As a result, present and intended loggings in forested Lapland...are unsustainable and in obvious conflict with the biological diversity conservation agreements to which Finland is committed.' The letter also warned that logging practices are seriously affecting the livelihood of the indigenous Sami people in Lapland.[16]

In 2011, US environmentalists contacted the Scottish Government last March in respect of the Forth Energy biomass proposals. They stated in their letter:

> 'The southeastern US contain some of the most biodiversity-rich ecosystems in North America and have experienced massive losses with the conversion of natural forest to industrial pine plantations…only about 182 million acres of the former 356 million acres of natural forest still remain. Over 15 percent of the remaining forested area has been converted to industrial pine plantation monocultures, which provide little habitat for biodiversity. This conversion has been accompanied by a near 800 percent increase in the use of chemical fertilizers and escalating use of toxic herbicides and pesticides in the region. Industrial plantations are expected to expand to over 52 million acres. Projections are that logging will increase by 50 percent to over eight million acres a year by 2040.
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> This large scale destruction and conversion of forest in the southeastern US has been undertaken to supply already existing demands and projected growth. What's more, the US has its' own growing demand for biomass electricity and heat, many also with the expectation that they will source wood from southeastern pine plantations. Demand for biomass to burned in Scottish power plants will be additional to the above. It is clear that all of these competing demands will result in serious further damage to southern ecosystems.'[17]

A study by Marshall Wise et al showed that carbon reduction policies which only account for fossil carbon will result in all natural forests and virtually all natural grasslands being destroyed by 2065.[18]

Subsidies for bioenergy inevitably lead to maximum land conversion and thus ecosystem destruction and humanitarian impacts compared to other forms of renewable energy. Another recent study by Robert McDonald et al shows that bioenergy for electricity is the most inefficient use of land, requiring 2,844 – 4,294 km2/GW, more than any other type of electricity generation. By comparison, onshore wind requires 199-243 km2/GW, solar thermal 26-52 km2/GW and solar PV 52-130 km2/GW.[19]

Carbon policies which do not take into account the need to preserve forests can only result in increased forest loss which will ultimately accelerate climate change as well lead to a dramatic biodiversity loss. In the Scottish context, therefore, the Government must ensure that demand does not exceed supply.

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[15] Appeal: Protect Sweden's Old Growth Forests, http://protecttheforest.se/upprop/en

[16] Open letter demanding end for logging in remaining natural forests in Finland (February 2007), http://www.forestinfo.fi/forestlapland/researchersletter.htm

[17] An open letter against biomass in Leith from America (31 March 2011), http://www.guardian.co.uk/edinburgh/2011/mar/31/leith-biomass-friends-of-the-earth-open-letter

[18] Wise et al, 'Implications of Limiting CO2 Concentrations for Land Use and Energy' 324(5931) *Science* 1183, at www.sciencemag.org/cgi/content/abstract/324/5931/1183

[19] McDonald et al, 'Energy Sprawl or Energy Efficiency: Climate Policy Impacts on Natural Habitat for the United States of America' PLoS ONE 4(8): e6802, www.plosone.org/article/info:doi/10.1371/journal.pone.0006802

This will only be possible if it removes ROCs from all biomass, bioliquids, and energy crops.

3. Human Rights abuses and concerns due to increased demand for bioenergy

The sustainability criteria for bioliquids in the RED and those proposed for biomass in Scotland **ignore human rights, land rights, hunger and malnutrition, pesticide poisoning and all other impacts on people in producing countries.** They have been condemned by hundreds of civil society organisations, many of them from the global South.

Forest-dependent peoples and other communities will be seriously affected by greater industrial logging and by tree plantation expansion. New plantation concessions are already being granted, for example in Brazil, Guyana, Republic of Congo and West Papua.

In West Papua, for example, Medco has been granted a large concession for rainforest land to establish plantations for bioenergy woodchips and pellets for export. Medco has allegedly been implicated in land grabbing and deforestation.[20] Exiled tribal leader Benny Wenda gave the following testimony to Friends of the Earth Scotland[21]:

> 'Massive deforestation means many Papuans in the Merauke district will lose their source of livelihood. Most do not have the skills to compete with workers from outside the area to work on industrial agriculture projects. I am also concerned that deforestation will lead to conflict between tribes, who will be competing for food and resources.'

Friends of the Earth Scotland reports that Medco's management plan, for an area still covered in rainforest, states: 'The land will be divided into six regions in which all broad-leaved trees in one of the six regions will be completely cut down.'

In Brazil, eucalyptus plantations are being expanded rapidly, at the expense of highly biodiverse and carbon-rich wooded savannah.[22] Tree plantations for biomass exports to Europe are being established in the Republic of Congo.

In Brazil, Suzano Papel e Celulose is investing $1.3 billion in the production of wood pellets from eucalyptus for export to Europe. They have recently signed a Memorandum of Understanding for the supply of pellets to MGT Power, a UK energy firm whose plans for a 295 MW biomass power station south of the border in Teesside have been approved and who have also applied for a similar power station in Tyneside.

Suzano is heavily involved in the development and promotion of Genetically Engineered eucalyptus. The wood is expected to come from Piaui, where the last remnants of the Atlantic Forests are being destroyed for eucalyptus and other plantations. Suzano and other Brazilian plantation companies have been denounced by civil society groups in Brazil for evicting indigenous peoples, Afro-descendent people and peasants.[23]

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[20] West Papua Media Alerts, 'PT Medco refuses to pay compensation for Papuan land used for three years' (21 April 2011), http://westpapuamedia.info/2011/05/01/pt-medco-refuses-to-pay-compensation-for-papuan-land-used-for-three-years/

[21] Friends of the Earth Scotland Website, 'West Papua Case Study – Deforestation', at http://www.foe-scotland.org.uk/forests-westpapua

[22] World Rainforest Movement, 'The new trend of biomass plantations in Brazil: tree monocultures', (November 2011), http://www.wrm.org.uy/bulletin/172/Brazil.html

[23] Women on the March, 'Brazil: For whom and why do women struggle?' (22 March 2010), http://womenonthemarch.wordpress.com/2010/03/22/brazil-for-whom-and-why-do-women-struggle/

Human rights abuses, including evictions and pesticide poisoning, slave-like working conditions, more hunger and malnutrition as people are displaced from their land, forests and pasture are turned into plantations – those realities of tree plantations are entirely ignored under the RO and RED sustainability criteria – feedstocks grown on areas implicated in land-grabbing will be able to be certified as 'sustainable' under the sustainability criteria.

(d) Concerns over Monitoring and Certification Schemes

A stretched international supply chain is inherently much more difficult to monitor and virtually impossible to control. The experience with timber extraction for construction, furniture and paper production bears this out. It was necessary for the EU to legislate in 2010 to ban imports of illegally harvested timber even though voluntary certification schemes run by the FSC and PEFC have been in operation for many years. It is implausible that illegally harvested timber will not find its way into the biomass supply chain, as demand is stimulated by renewable energy financial incentives.

Primary forests logged industrially for the first time - certified or otherwise - are destroyed and what remains is often permanently ecologically damaged. Logged primary forests' carbon stores, biodiversity and ecosystems will never be the same. Selectively logged rainforests become fragmented, burn more and are prone to deforestation.

Best estimates are that the FSC for example has already certified first time industrial logging of sixty million hectares of primary and old-growth forests, and an equal amount is threatened. This is an area the size of South Africa.

A significant proportion biomass imports are likely to come from countries where governance arrangements are weak. An example is given in the Environmental Investigation Agency report, 'UP FOR GRABS - Deforestation and Exploitation in Papua's Plantations Boom':

'Between 2000 and 2005 massive illegal logging and timber smuggling activities focusing on merbau timber in Papua led to 300,000 cubic metres of logs flowing unimpeded to China every month for the flooring sector. This was a billion dollar a year racket coordinated by international criminal syndicates facilitated by corrupt officials and security apparatus at the highest levels. In Indonesia commercial stocks of merbau are only found in Papua. Papuans were being robbed, typically receiving just US$ 10 for timber fetching over US$250 in China and sold as flooring for US$2,288 in the EU.'[24]

The 2010 'Report from the Commission to the Council and the European Parliament on sustainability requirements for the use of solid and gaseous biomass sources in electricity, heating and cooling' commented in relation to certain countries outside the EU, that:

'At a global level, deforestation and forest degradation continue...Among the root causes for deforestation and forest degradation are weak governance structures for forest conservation and sustainable management of forest resources, in particular in developing countries. A large number of countries are party to intergovernmental initiatives to put in place criteria and indicators to monitor sustainable forest management, but they are not entirely based on common principles and criteria and do not have a mechanism for verifying compliance with the agreed principles.'

[24] Environmental Investigation Agency, UP FOR GRABS - Deforestation and Exploitation in Papua's Plantations Boom (November 2009), http://www.eia-international.org/files/news566-1.pdf

4. Inefficiency and other concerns

(a) Biomass power generation is inefficient

Biomass power generation is an inefficient process, with commonly 75% of the energy available in the biomass is wasted as heat. This figure does not account for the energy required for example to turn process wood into pellets. We note with concern that CHP Biomass still allows for an inefficient use of the resource.

Article 13(6) RED recommends,

'In the case of biomass, Member States shall promote conversion technologies that achieve a conversion efficiency of at least 85% for residential and commercial applications and at least 70% for industrial applications.'

In respect of CHP, Article 12(2) Cogeneration Directive requires,

'[Electricity] production can be regarded as high-efficiency cogeneration provided it fulfils the efficiency criteria in Annex III(a) and, for cogeneration units with an electrical capacity larger than 25 MW, the overall efficiency is above 70%.'

This has been implemented in the UK through the CHPQA Standard. However, that standard is not definitive, and is subject to the interpretation of the CHPQA Guidance Notes. CHPQA Guidance Note 44 states that CHP biomass power stations achieving efficiency levels of as low as 35% remain eligible for CHP subsidies because it would be too onerous to meet the requisite 70% efficiency standard. This effectively overrides the 70% efficiency requirement for CHP biomass. This issue is explored and explained more fully in detail in relation to the Consultation Question relating to CHP Biomass.

(b) Black Carbon and Soot and local air quality

Black Carbon is considered by some scientists to be the second largest contributor to global warming after CO2. Yet the biomass sustainability criteria and the carbon saving thresholds in the RED and the RO do not attempt to deal with the issue or apply any factor to allow for this deleterious impact of burning biomass.

The UN's Economic Commission for Europe found, 'Urgent action to decrease (black carbon) concentrations in the atmosphere would provide opportunities, not only for significant air pollution benefits (e.g. health and crop-yield benefits), but also for rapid climate benefits, by helping to slow global warming and avoid crossing critical temperature and environmental thresholds.'[25]

James Hansen's report in 2003, 'Soot climate forcing via snow and ice albedos' concluded:

> 'The soot effect on snow albedo may be responsible for a quarter of observed global warming. Restoration of snow albedos to something approaching pristine preanthropogenic values would have the double benefit of reducing global warming and raising the global temperature threshold at which dangerous anthropogenic interference with climate occurs.
>
> Already, soot emissions from coal are decreasing in many regions with transition from small users to power plants with scrubbers. The largest source of soot in

[25] UNECE's Executive Body for the Convention on long-range transboundary air pollution, meeting in Geneva, 15-18 December 2008

developed countries is now diesel fuel, and in developing countries biofuels are also important.'[26]

Mark Jacobson, director of Stanford University's Atmosphere / Energy Programme has written: 'Controlling soot may be the only method of significantly slowing Arctic warming within the next two decades. We have to start taking its effects into account in planning our mitigation efforts, and the sooner we start making changes, the better.'

Both local and transboundary air pollution will be increased by expansion of bio-energy.

The UK Renewable Energy Strategy 2009 reported that up to 1.75 million life years would be lost in the UK in 2020 due to emissions caused by bioenergy expansion. Although it is believed the majority of the mortality effects will arise from biomass heating systems sited in urban areas, nonetheless the presence of large biomass electricity power stations that are operated typically 8000 hours a year, and will consume many millions of tonnes of wood fuel per annum, must be a major concern. Particulate emissions are very difficult to effectively screen, especially the very small and most harmful ones. Several planned power station developments are sited in areas close to residential areas.

(c) Biomass Demand Will Lead To Genetic Engineering Of Trees

The growing demand for bioenergy is being used by companies such as ArborGen, Suzano and Weyerhaeuser to speed up the development of Genetically Engineered trees, such as cold-resistant eucalyptus and faster-growing trees. The UK Government's proposed 'sustainability standards' do not preclude use of woodchips and pellets from GE trees. In the UK, MGT Power's main woodchip supplier is now expected to be Suzano Papel e Celulose who are strongly involved in the development of GE tree plantations in Brazil. Forth Energy, who are proposing four large biomass power stations in Scotland, state that they want to burn large amounts of eucalyptus and list four regions for supplies (Florida, Baltic States, Scandinavia and UK) where eucalyptus is not commercially grown at present. They state that most of the wood will come from Florida. ArborGen have permission from the US government to plant 250,000 GE eucalyptus trees in the Southeastern US, including Florida (subject to a legal challenge by environmental organisations) and seek to commercialise GE eucalyptus in the region.

GE trees pose a serious risk to forests because they can spread across large areas, cross-pollinate with non-GE trees and mutate in ways which cannot be predicted. Furthermore, eucalyptus is highly invasive, requires large quantities of water and thus worsens groundwater depletion and droughts, and is very flammable. Furthermore, commercial release of GE trees would increase companies' financial incentives to replace forests and other ecosystems with such plantations.[27]

We now answer the specific Consultation Questions that relate to bioenergy.

Q 1. What are your views on our proposal not to incentivise new large scale dedicated biomass electricity?

We agree that large scale dedicated biomass electricity should not be incentivised.

[26] Hansen, 'Soot climate forcing via snow and ice albedos'. PNAS January 13, 2004 vol. 101 no. 2 423-428, http://www.pnas.org/content/101/2/423.long

[27] 'Stop Tree Monocultures and GE Trees Campaign', www.globaljusticeecology.org/stopgetrees.php

We refer the Scottish Government to our General Comment above which explains in full detail that we are opposed to the growth of industrial biomass and bioliquids because they will (1) increase Carbon Dioxide emissions; (2) Worsen deforestation; (3) lead to human rights abuses and (4) be an inefficient use of an already scare resource.

However, we note with concern that this proposal will be rendered effectively meaningless if subsidies for other forms of bioenergy remain in place, and as such we urge the Scottish Government to remove subsidies for all biomass and bioliquids.

Q2. Under which circumstances would it be appropriate to set a threshold for electricity only generation?

N/A –

Q3. At what level should any threshold be set?

The threshold should be set at zero.

The Scottish Government's own position is for biomass deployed in heat-only or combined heat and power schemes. To give effect to this, it must remove all subsidies from electricity-only biomass.

Biofuelwatch's position is that there cannot be any justification for electricity-only biomass on any scale. We refer the Government to our General Comment above, and restate out four key concerns over the use of industrial bioeneregy in the UK, which are that industrial bioenergy in Scotland will (1) increase Carbon Dioxide emissions; (2) Worsen deforestation; (3) lead to human rights abuses and (4) be an inefficient use of an already scare resource.

Offering ROCs for small scale biomass will not effectively deal with any of these concerns.

Firstly, it does not tackle the fact that the carbon emissions are inadequately quantified under the RO.

Secondly, if ROCs remain available for dedicated biomass power stations falling under a proposed threshold - for example, 10MW – this might not necessarily deal the with issue of sustainability of supply. This is because it would not restrict the number of planning applications for biomass power stations in Scotland.

Thirdly, it does not deal with the human rights concerns which would remain relevant due to the additional pressure for land and wood posed by demand for biomass.

Fourthly, electricity-only biomass is unjustifiably inefficient, regardless of the scale.

Q4. What are your views on whether or not our incentives under the ROS in Scotland should mirror the UK Government's proposals on enhanced co-firing and conversion?

Incentives under the ROS in Scotland should **not** mirror the UK Government's proposals on enhanced co-firing and conversion.

The Scottish Government's position

The Scottish Government's stated position is of favouring 'biomass deployed in heat-only or combined heat and power schemes, off gas-grid, at a scale appropriate to make best use of both the available heat, and of local supply'.'[28]

The introduction of a new subsidy for co-fired biomass and biomass conversion would effectively undermine the Scottish Government's own position on two counts:

(1) The subsidy is proposed for electricity-only generation, whereas the Scottish Government has committed to heat only or CHP Biomass.
(2) The subsidy is proposed for power stations using biomass on an unlimited scale, whereas The Scottish Government's position is to deploy biomass on a scale appropriate to make best use of **local supply** as well as heat.

Already, the proposed Hunterston development in Ayrshire proposes to burn biomass alongside coal, with no proposal to make use of heat. At a capacity of 1600MW, to be eligible for the subsidy, it will have to supply 15% biomass: that would be a 240MW capacity for biomass. This alone would require 1,560,000 odt per year,[29] which alone is far more wood than is available in Scotland according to the figures produced by the Wood Fuel Task Force, which are:

Current: 432,400 ODT
2012-2016: 867,100 ODT
2017 – 2021: 1,183,700 ODT[30]

Note that these figures refer to all types of wood, including waste wood, not yet committed to existing markets, for use across all industries (not just the energy industry).

We remain concerned that a subsidy for co-fired biomass may potentially also have implications for Cockenzie and Longannet. Combined, these power stations have a 3600MW capacity. To be eligible for the subsidy, they would have to have a 540MW capacity for biomass, which would require 3,510,000 odt per year, posing an unprecedented demand for wood.

It is worth noting that although there are no co-firing facilities as yet in Scotland, in England, the largest biomass facility is a co-firing one, with Drax burning over 1 million tonnes of biomass per year. It is also worth noting Xero Energy's finding in this regard that the major market for Scottish pellets at present is for co-firing.[31]

As well as having an impact on Scotland's own wood fibre resources, our position is that this unprecedented demand would lead to the adverse impacts of the bioenergy industry as outlined in our General Comment.

Q5. Is a maximum threshold for biomass CHP plants required?

Yes – the threshold should be zero: no ROCs should be offered for any sized biomass CHP plants.

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[28] Scottish Government 'Draft Electricity Generation Policy Statement 2010,' http://scotland.gov.uk/Resource/Doc/331717/0107930.pdf, page 10

[29] Calculated on the understanding that a 1MW capacity biomass power station requires 6500 odt.

[30] Wood Fuel Task Force 2, 'The Supply Of Wood For Renewable Energy Production In Scotland' (March 2011), available at http://www.forestryscotland.com/media/142731/woodfueltaskforceupdatereport_2011.pdf, p 31

[31] Xero Limited, 'Supporting Biomass Electricity in the Renewables Obligation (Scotland): Prepared for Forestry Commission Scotland and the Scottish Government' (December 2011), p 15, http://www.forestry.gov.uk/pdf/BioenergyReportDec2011.pdf/$FILE/BioenergyReportDec2011.pdf

If subsidies for CHP biomass remain, they will be available to facilities achieving very low efficiency levels, which would be contradictory to the Scottish Government's own stated policy to favour efficient biomass. Subsidies for Biomass CHP under this banding would effectively serve as a loophole to the proposed removal of support for large-scale electricity-only dedicated biomass.

The Scottish Government's Position

The rationale for the Scottish Government's position to favour 'biomass deployed in heat-only or combined heat and power schemes, off gas-grid, at a scale appropriate to make best use of both the available heat, and of local supply' is contained in the Draft Electricity Generation Policy Statement 2010. One of the policy rationales is the following:

'Use of available heat in heat-only and CHP schemes achieves 80-90% energy efficiency for the former and 50-70% for the latter as opposed to 30% in electricity-only schemes.'[32]

European Union Policy also recommends that Biomass Power Stations achieve efficiency levels of 70%. Article 13 (6) Renewable Energy Directive reads, in relevant part:

"In the case of biomass, Member States shall promote conversion technologies that achieve a conversion efficiency of at least 85% for residential and commercial applications and at least 70% for industrial applications."

This efficiency standard is a reflection of an earlier provision in the European Union Cogeneration Directive, which sets out in Article 12(2), in relevant part:

'[Electricity] production can be regarded as high-efficiency cogeneration provided it fulfils the efficiency criteria in Annex III(a) and, for cogeneration units with an electrical capacity larger than 25 MW, the overall efficiency is above 70%.'

The CHPQA Standard

The Quality Assurance for Combined Heat and Power ('CHPQA') was designed to implement this 70% efficiency standard. The CHPQA defined itself as 'an initiative by the [UK] Government to encourage the wider practical application of Good Quality Combined Heat and Power, Community Heating and Alternative Fuel technologies. CHPQA aims to monitor, assess and improve the quality of UK Combined Heat and Power.'[33]

The CHPQA was designed to give effect to and implement Article 12 (2). It states,

> 'The calculation of primary energy savings will comply with Article 12(2) of the European Union Directive 2004/008/EC- Promotion of Cogeneration based on a useful heat demand in the Internal Energy Market. Therefore, GQCHP Schemes with total installed capacity of

[32] Scottish Government 'Draft Electricity Generation Policy Statement 2010,' http://scotland.gov.uk/Resource/Doc/331717/0107930.pdf, p 10

[33] DEFRA, 'The CHPQA Standard' Issue 3 (January 2009), https://www.chpqa.com/guidance_notes/documents/CHPQA_Standard_Issue3.pdf, p 3

> • <1MWe - provide > 0% primary energy savings compared with the [Cogeneration] Directive's harmonized reference values for separate production of heat and electricity;
>
> • ≥1MWe - provide ≥10% primary energy savings compared with the [Cogeneration] Directive's harmonized reference values for separate production of heat and electricity;
>
> • >25MWe - have an overall efficiency of above 70% (based on Net Calorific Value).'[34]

Power stations under 25MW

For power stations under 25MW, The Combined Heat and Power Quality Assurance (CHPQA) Standard, Issue 3, January 2009, provides that biomass power stations up to 25 MW will be considered to be 'good quality CHP' even if they only achieve 10% greater efficiency "*compared with the Directive's harmonized reference values for separate production of heat and electricity*" The reference values have been determined by the European Commission. A 10% increase on those reference values, for a biomass power station burning mainly wood but also some 'agricultural biomass' (including miscanthus and willow) and some biodegradable waste, would translate into about 35% overall efficiency.

Therefore, **the Scottish Government's understanding that 'use of available heat in heat-only and CHP schemes achieves 80-90% energy efficiency for the former and 50-70% for the latter' would not be true in the case for Biomass Power Stations below 25MW in receipt of a CHP subsidy.**

Power stations over 25MW

The CHPQA Standard is not a conclusive stand alone document. It states,

> '[The CHPQA Standard] should be read in conjunction with the supporting CHPQA Guidance Notes, which provide detailed information on how this Standard will be interpreted by Government Departments and agencies as well as guidance on compliance with this Standard.'[35]

It is also is not the case that power stations must meet the standards contained in the CHPQA Standard to be eligible for subsidy:

> 'This Standard **does not address issues relating to the use of CHPQA for determining eligibility for fiscal benefits. For these matters, reference should be made to the CHPQA Guidance Notes** and, where necessary, the appropriate Government Department.'[36]

The relevant Guidance Note which deals with the use of CHPQA for determining eligibility for fiscal benefits is 'Guidance Note 44: Use Of CHPQA To Obtain Renewables Obligation

[34] Ibid.,p 4, and DECC, 'Guidance Note 10: Defining Good Quality CHP- Criteria For Good Quality CHP' (2007), https://www.chpqa.com/guidance_notes/GUIDANCE_NOTE_10.pdf, pp 2-3
[35] DEFRA, 'The CHPQA Standard' Issue 3 (January 2009), p 3
[36] Ibid., p 3

Certificates (ROCs) Including Under A Banded Obligation (Expected To Apply From April 2009).'[37]

> The relevant part of Guidance Note 44 states:
>
> 'Large CHP plants (installed generation capacity greater than 25MWe) must comply with the overall efficiency criteria required by the EC Cogeneration Directive (above 70% on Net Calorific Value). The [Quality Index] QI formulae have been modified within the CHPQA methodology in order to ensure that Schemes who meet the QI threshold comply with this requirement (see CHPQA Standard, Issue 2, November 2007).
>
> 'This overall efficiency criteria can be met by large CHP Schemes using conventional fuels**. However, Large Energy from Waste (EfW) and biomass-fuelled CHP plants >25MWe are unable to comply with this criteria, so would not fully qualify for ROCs.**
>
> **To overcome this we have developed separate criteria for EfW and biomass CHP Schemes to be fully eligible for ROCs as set out in this note. They must demonstrate at least 35% overall efficiency (gross calorific value) and deliver at least 10% Primary Energy Savings (PES) when compared with the alternative for the separate generation of electricity and heat***.* Where the Scheme fails to meet this threshold, their entitlement to ROCs is restricted through the QPO being scaled back on their CHPQA certificate (see CHPQA GN 4 for a description of the scale back mechanism). The new Renewables Obligation Order 2009 will refer to the criteria set out in this note.'[38]

The effect of this provision is to override the requirement of the CHPQA Standard which requires Biomass facilities of over 25MW to obtain 70% efficiency levels (net calorific value) and the EU Cogeneration Directive in relation to eligibility for ROCs.

Therefore, the Scottish Government's understanding that 'use of available heat in heat-only and CHP schemes achieves 80-90% energy efficiency for the former and 50-70% for the latter' would also be untrue in the case for Biomass Power Stations over 25MW in receipt of a CHP subsidy.

Continued subsidies for CHP biomass would therefore be able to supply a nominal amount of heat and remain eligible for subsidy under the CHP Banding. This would effectively see pressure on domestic and international wood supplies continued. Note that Table 1 above indicates that the vast majority of biomass power stations in the pipeline, which would see demand for wood soar to over 5 times available domestic supply would classify themselves as 'CHP' Power stations. However, given the lack of Local District Heating systems in Scotland at present, it is highly unlikely that any of them will be able to achieve genuinely high efficiency standards – indeed, nowhere in the UK has any biomass power station achieved genuinely high efficiency standards.

Finally, Biofuelwatch also considers that the Scottish Forestry Commission's report of October 2011, 'Research to support the review of the Renewable Obligation Scotland and

[37] DECC, 'Guidance Note 44 Use Of Chpqa To Obtain Renewables Obligation Certificates (Rocs) Including Under A Banded Obligation (Expected To Apply From April 2009)' (2008), available at https://www.chpqa.com/guidance_notes/GUIDANCE_NOTE_44.pdf
[38] Ibid., p 4

impact of the Renewable Heat Incentive Part 2: Biomass thresholds for electricity, CHP and heat generation' does not appear to have picked up on this loophole.

In their report, the Forestry Commission concludes that with regards to the question about a capacity threshold for CHP Biomass, it could not reach an answer due to the complexities of the issue, but emphasised the need to promote Good Quality CHP – in their opinion, **'partly based on higher overall energy efficiencies.'**[39]

However, in their understanding of Good Quality CHP, they only refer to the EU Cogeneration Directive and to Quality Assurance of Combined Heat and Power (CHPQA) Guidance Note 10. They do not refer to Guidance Note 44 which deals with fiscal policy.

Worryingly, The Commission's Report states, 'It can be seen that [the rules in Guidance Note 10 and the Cogeneration Directive] restrict the combinations of overall energy efficiency and heat-to-power ratio of CHP plants that can be classified as good quality. **This, in turn, determines whether such plants can meet the requirements of the ETS and Renewable Obligations**. In particular, it should be noted from Figures 34 to 36 that, as the scale of a CHP plant, denoted by its electrical output rating, increases, its overall energy efficiency must also increase in order to achieve the Quality Index required by these regulations.'[40]

Their understanding here is erroneous, because Guidance Note 44 re-defines Good Quality CHP for the purposes of ROCs, and which, as explained, effectively serves as a loophole.

Biofuelwatch's position

Biofuelwatch notes that if the Scottish Government is to give effect to its own stated policy on CHP efficiency levels, it must remove subsidies from CHP Biomass or depart from the UK's definition of 'Good Quality CHP' as outlined in Guidance Note 44, which would be within its competence.

However, we reassert that our own position is not to support highly efficient CHP Biomass power stations. Although genuinely efficient CHP biomass would be less wasteful use of a finite resource, this would not negate our other stated concerns with bioenergy which we have outlined in our introductory section, namely:

1. The large-scale use of bioelectricity will not help Scotland decarbonise its electricity sector and deliver the reductions in greenhouse gas emissions urgently needed to avoid irreversible and catastrophic climate change; instead it will increase global greenhouse gas emissions.
2. Directly and indirectly, the bioenergy industry will lead to tree plantation expansion and more destructive logging, much of it in the global South.
3. Sustainability criteria and greenhouse gas standards intended to make bioelectricity 'sustainable' cannot and will not prevent serious negative impacts on the climate, on forests and grasslands, on forest-dependent peoples and other

[39]North Energy on behalf of the Scottish Forestry Commission, 'Research to support the review of the Renewable Obligation Scotland and impact of the Renewable Heat Incentive Part 2: Biomass thresholds for electricity, CHP and heat generation' (December 2011), available at http://www.forestry.gov.uk/pdf/ReviewofRenewableObligationScotlandandimpactofRenewableHeatIncentive.pdf/$FILE/ReviewofRenewableObligationScotlandandimpactofRenewableHeatIncentive.pdf, p 44

[40] Ibid., p 35

communities who will be affected by tree plantations and logging, and on UK communities who will be affected by more harmful air pollution.

Q 6. What are your views on the continued appropriateness of the 90% biomass content threshold?

This question is not considered relevant, as biomass simply should not be subsidized under any circumstances, irrespective of the organic content of the fuel in question.

Ancillary points which Biofuelwatch wishes to raise in relation to the Scottish Government's Banding Proposals:

1. **<u>Subsidies must be removed from bioliquids as well as biomass</u>**

The Westminster Consultation has proposed a cap on ROCs available to bioliquids. This cap would still allow the equivalent of five 50 MW biofuel power stations to be run near continuously. However, the Scottish Consultation has not suggested an equivalent cap. If developers are prevented from gaining ROCs for bioliquids South of the border, there is a likelihood that they would move their developments to Scotland where no such cap has been proposed, with devastating consequences.

Just one 50MW power station run exclusively on palm oil (by far the cheapest vegetable oil) would require at least 22,000 hectares of new oil palm plantations to be developed for the purpose. For other types of vegetable oil, even more land would be needed. This will mean more deforestation (directly or indirectly) and more land-grabbing.

All current biofuels have been shown to be worse for the climate than the fossil fuels they replace if all direct and indirect impacts are considered. Palm oil is by far the cheapest type of biofuel that can be burned for heat and power and that is widely available. According to a 2007 report by the UN Environment Programme, palm oil is the main cause of permanent forest loss in Indonesia and Malaysia.[41] It is also increasingly a driver of deforestation in many other countries, including the Philippines, Papua New Guinea, Cameroon, Uganda, Benin and Mexico. Emissions associated with palm oil biofuels can be even higher than those from tropical deforestation in general: Particularly in Indonesia and Malaysia, a high proportion of new oil palm plantation is on peatlands. One study found that CO2 emissions from peat fires in 2006 Indonesia alone were 900 million tonnes – far more than the UK's annual greenhouse gas emissions.[42]

Even burning European rapeseed oil has been shown to be worse for the climate than burning mineral oil, due to emissions linked to fertiliser use and indirect land use change are considered.[43] Used cooking oil and some types of residues, such as tall oil, are often considered to be the most 'climate friendly' biofuels, however both are in very short supply and are already in high demand, for example for transport biofuels in the case of used cooking oil and by the chemical industry in the case of tall oil. Burning them in power stations will simply cause more palm oil or fossil fuels to be used elsewhere.

In addition, the implications on the right to food of using food crops for fuel and electricity have been well versed. In the transport sector, competition between crops for food and crops for fuel due to the increased Western demand for biofuels have driven food prices up in recent years, with the result that the world's poorest are deprived of the right to food.

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[41] UNEP, 'The Last Stand of the Orangutan- State of Emergency: Illegal Logging, Fire and Palm Oil in Indonesia's National Parks' (2007), http://www.unep.org/publications/search/pub_details_s.asp?ID=3920

[42] Science Daily, 'Peat Fires Drive Temperatures Up: Burning Rainforests Release Huge Amounts of Greenhouse Gases' (27 Novermber 2009), available at http://www.sciencedaily.com/releases/2009/11/091127132838.htm

[43] Birdlife International, 'Environmental impacts of current biofuels', available at http://www.birdlife.org/eu/EU_policy/Biofuels/eu_biofuels2.html

2. The definition of Anaerobic Digestion should exclude biogas supplied from energy-crops

We are concerned that the definition of Anaerobic Digestion is open to including biogas supplied from dedicated crops rather than from waste only. This could effectively lead to food crops being grown specifically for producing biogas. Other countries, such as the Netherlands, have restricted biogas subsidies to certain types of waste only.

Most people in the UK associate biogas with energy from food waste. The consultation also refer to, sewage, slurries as well as food waste. When organic waste rots in landfill it emits methane, which is more than 20 times as powerful a greenhouse gas as carbon dioxide when calculated over a century. Turning such waste into biogas rather than putting it into landfill is clearly beneficial for the climate, provided that biogas does not compete with composting and thus lead to more synthetic fertilisers being used.

What the experience with biogas in Germany has shown, however, is that subsidies for biogas that do not discriminate between biogas from waste and biogas from whole crops, especially maize, result in large-scale land conversion and create the same food versus fuel conflict as biofuels. In Germany, even carbon-rich moorlands and nature reserves are being ploughed up and turned into maize monocultures and then cultivated with fertilisers which result in high emissions of nitrous oxide, a greenhouse gas some 300 times as powerful as CO2 – all of that to feed the country's 6,000 biogas digesters. The direct and indirect climate impacts of maize biogas are thus likely to be very negative.[44]

Large-scale biogas production from whole crops such as maize will cause the same food-versus-fuel competition and is likely to further push up food prices in the same way as is the case for European and US biofuel production from corn and wheat.

Given these concerns, we are against any ROCs for biogas made from crops.

Biogas made from sewage, slurries and true food waste seems sensible but this may well be better used from the point of view of efficiency for transport or piped into the mains gas infrastructure for heating.

3. ROCs for Waste should be removed

The consultation proposes to continue supporting electricity from waste, including waste, which is not biomass but is derived from fossil fuels. Specifically, it proposes to maintain ROCs for energy from waste with CHP, and fossil-fuel derived waste (as well as biomass) gasification and pyrolysis. There are serious concerns about the impacts of waste incineration (including pyrolysis and gasification) including on air pollution and public health and on recycling and overall resource use. Under the EU Renewable Energy Directive, energy from non-biomass waste is not classed as renewable energy. Providing financial support for energy from waste is therefore not compliant with the RED.

4. We do not believe that sustainability concerns can be achieved through a revision of the sustainability criteria

The Scottish Government has stated that 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.

[44] Zeit Online, 'Biostrom, nein danke!' at http://www.zeit.de/2011/29/Biogas/seite-3

However, Biofuelwatch emphasises that an approach based on a combination of ROCs plus any kind of sustainability criteria cannot ensure a respect for environmental and human rights, because they cannot tackle the root cause of the problem, which is namely the unprecedented scale of the demand for land which will invariably directly ***and indirectly***, lead to the large-scale acquisition of land overseas, with associated concerns. Furthermore, compliance with the criteria cannot be easily verified and is not independently audited.

5. Legal obligations

Biofuelwatch notes that it falls within the Scottish Government's sphere of competence to differ from the UK Government's determination on ROCs (see DECC, 'Renewables Obligation Banding Review Process', paragraphs 1.8-1.9) March 2010.

Thank you for taking into account our consultation response.

Yours sincerely

Emilia Hanna

Biomass Campaigner

Biofuelwatch