

Introduction to bioenergy and waste incineration in the Renewables Obligation

What is the Renewables Obligation?

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.

How high are the subsidies for bioenergy?

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.

The number of ROCs available and thus the level of subsidy varies according to the type of energy produced. A full list of how many ROCs are available for which type of energy is available at tinyurl.com/3pwjzr9 (Tables 1 and 2). At present

- ✧ half a ROC per MWh is available to co-firing of biomass (other than 'energy crops') without CHP;
- ✧ one ROC per MWh is available to: co-firing of 'energy crops', co-firing of biomass with combined heat and power, standard gasification and pyrolysis, 'energy from waste' with CHP;
- ✧ 1.5 ROCs per MWh are available to: co-firing of 'energy crops' with CHP, stand-alone ('dedicated') biomass power plants;
- ✧ Biogas (anaerobic digestion), 'advanced' gasification and pyrolysis, stand-alone biomass power plants with CHP, and the burning of 'energy crops' attract 2 ROCs per MWh.

Over the last year, ROCs have been trading at a value of £48.70 each on average (tinyurl.com/3apcs4j). **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:

If **W4B**, who have planning permission for two biofuel power stations with a combined capacity of 68MW 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').

If **Forth Energy** get permission for and build the four biomass power stations which they have proposed, with a combined capacity of 540 MW, then they would get at least **£315 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.

Drax currently receives an estimated £43 million a year for burning over 1 million tonnes of mainly imported biomass.

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.

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 has 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. The 'greenhouse gas standards' are based on an accounting methodology which has been strongly criticised by the European Environment Agency's Scientific Committee (tinyurl.com/6eucukb). 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.

What subsidies are available for electricity from waste generation?

Waste that is at least 90% derived from "plant matter, animal matter, fungi or algae" is classed as 'biomass'. Waste that is up to 90% derived from fossil fuels is classed as 'waste'. Electricity from the latter is 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.

By April 2011, only two waste incinerators had received ROCs (tinyurl.com/3sxgmfj): One in Fawley (Pyros), the other in Avonmouth (Wessex Water Services) and since then a waste gasification plant on the Isle of Wight (Energos) became the first of its kind to be accredited for ROCs (tinyurl.com/5u5lhy3). However, as with biomass power stations, waste incineration companies are also likely to be waiting for a decision as to whether such plants would receive a

substantial level of ROCs long-term before commissioning new ones. And several of them have expressed an interest in building CHP, pyrolysis and gasification plants.

Meantime, 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'.

For more details about ROCs for waste incineration, pyrolysis and gasification, see <http://ukwin.org.uk/resources/rocs/>

What is the situation in Scotland?

Responsibility for deciding which types of energy are eligible for how many subsidies under the Renewables Obligation has been devolved to the Scottish Government. The Scottish Government will be issuing its own consultation on ROCs banding in late 2011 and then issue a separate Scottish Statutory Instrument based on its decision.

So far, Scottish governments have simply rubber-stamped whichever rules DECC had decided on for England and Wales. Current rules for ROCs are thus identical across Britain. The Scottish Government's 2020 Routemap for Renewable Energy (tinyurl.com/626z252) 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". This appears incompatible with ROCs for biomass, since those favour burning as much as possible for electricity. 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 (tinyurl.com/6em2zja).

How many biofuel (bioliquid) power stations are either planned or receiving ROCs?

So far, only one biofuel power station is operating and receiving ROCs. 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.

Four biofuel power stations have obtained planning permission, as far as Biofuelwatch is aware, and have not yet been built: A 19.5 MW one in Beckton, East London (Blue NG), a 50 MW one in Bristol (W4B), an 18.5 MW one in Portland, Dorset (W4B) and a 6 MW one in Chelveston, Northamptonshire (Chelveston Renewable Energy). Each of the four planning application listed palm oil as a possible or likely feedstock.

Four such planning applications have been rejected or withdrawn. Two applications are currently pending – one for a 7MW power station in Barnsley (Rocpower), the other for a 14MW one in Llangefni, Anglesey (EcoPellets). Three other proposals have been published but have not resulted in planning applications as yet (Blackrod/Bolton – Blue NG, North Killingholme, North Lincolnshire – Blue NG, Shoreham-on-Sea near Brighton – Edgeley Green Power).

For full details, see: www.biofuelwatch.org.uk/wp-content/uploads/Biofuel-power-stations.pdf

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 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.

How many biomass power stations are either planned or receiving ROCs?

Overall, biomass accounted for 78.5% of all energy classed as renewable in the UK in 2007 (tinyurl.com/6gkdo3l) and given the Governments' support for major bioenergy expansion, it is unlikely to become any less dominant in future.

At present, biomass burning accounts for just over 518 MW electricity capacity in the UK, including both dedicated biomass power stations and co-firing with biomass. This amounts to 4.3 million tonnes of biomass a year being burnt, most of it wood. The single biggest producer of biomass electricity at this time is Drax, who co-fired more than 1.1 million tonnes of mostly imported biomass last year. Drax has recently had plans for two biomass-only power stations approved which will burn just under 3 million tonnes per year.

Current biomass burning in the UK is a small fraction of what is planned and has been approved. Several of the developers have indicated that they are waiting for an announcement on future ROCs banding before starting construction.

So far, new biomass electricity capacity of 2,560 MW has been approved but not yet built. Applications for another 1,342 MW are pending and a further 1,421 MW have been proposed but are not yet in planning. Those figures only include power stations 18 MW and larger. Operating all of those power stations, including existing ones would require at least 58 million tonnes of biomass a year, of which the vast majority will be wood. That is not counting the wood required for smaller electricity and CHP plants, nor the projected expansion in the use of wood for heating, supported by the Government's Renewable Heat Incentive. By comparison, total UK wood production is less than 9 million tonnes a year. Not surprisingly, developers and DECC expect that most of the wood will be imported.

Biomass electricity is unlikely to be viable without subsidies.

What do ROCs mean for Anaerobic Digestion (biogas)?

ROCs are available for Anaerobic Digestion 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.