

Subsidising Biomass Electricity - Contracts for Difference and what they mean for dedicated and converted biomass power stations

New Government support for renewable electricity, and hence biomass electricity, is included in a range of measures and new legislation that is the Energy Act 2013. The Act is supposed to incentivise investment into replacing ageing electricity infrastructure with more diverse, lower carbon infrastructure. The Act and all its regulations determine the level of support for subsidies for each type of electricity classed as renewable, and apply to the whole of the UK. This is different from the current subsidy regulations, under the Renewables Obligation, which allow the Scottish Government and the Northern Ireland Executive to set their own rules about eligibility and banding for different types of renewable energy.

The specific support mechanism that will replace Renewables Obligation Certificates (ROCs) is called Feed-in-Tariff Contracts for Difference (FiT CfDs or just CfD). ROCs currently subsidise all electricity classed as renewable, including bioenergy and CfDs will do so in future. Just like ROCs, CfDs are subsidies that are not paid out of general taxation, but by electricity companies – often the same ones receiving the funds! Electricity suppliers are expected to pass them on through additional charges on household (and business) electricity bills. Under EU State Aid rules, this type of support is still considered a subsidy¹.

1. What are Contracts for Difference (CfDs) and how do they work?

Companies that generate electricity (electricity generators) will sign contracts with the body that administers the CfD system. This body will supposedly be a newly-created, Government-owned not-for-profit company – though for the time being it will be the (privately-owned) National Grid. The CfD contracts will set 'strike prices' – guaranteed prices for each unit of electricity that are set far above the market (or 'wholesale') prices. How high they are set depends on the type of technology and is set out in secondary legislation introduced by DECC for the whole of the UK. 'Strike prices' are guaranteed for a period of 15 years, thus promising generators and their investors long-term returns and profits.

Electricity suppliers (who supply electricity to their customers) will in turn be obliged to pay electricity generators the difference between the strike price and the wholesale price, on top of their wholesale contracts. The suppliers are expected to pass the cost onto their customers. DECC documents do not mention the scenario of the electricity supplier and the electricity generator being the same company – but of course, the Big Six are both, so they will effectively pay themselves the subsidies and charge their customers through a system which another company (National Grid) is paid by the government to administer!

DECC argues that electricity users will be protected because strike prices are fixed and if the wholesale (i.e. market) price of electricity rises, the strike price will still not go up. However, strike prices for several technologies including biomass will be increased in line with inflation and they not expected to be overtaken by the market prices. It seems unlikely that wholesale prices would overtake strike prices for anything more than a few months in the foreseeable future because the strike prices are set so high and wholesale

¹ <http://www.iisd.org/gsi/sites/default/files/primer.pdf>

prices have been relatively stable for several years, except for a brief spike in 2008. This means that consumers will pay the difference with increased bills as suppliers will pass on the costs to their customers. And while renewable energy subsidies have so far not been the key reason for rising electricity costs², any levies that support forest destruction, high carbon emissions and pollution from subsidies cannot be justified.

For some technologies, such as onshore wind, strike prices will actually be reduced incrementally in real terms over time – but for biomass, they will simply go up with inflation.

2. Phasing out ROCs

After 31st March 2017, all new projects will have to apply for CfDs rather than ROCs. Until then, operators can choose to opt for either of the two schemes. Between 2017 and 2027, projects already receiving ROCs will be “grandfathered” – this means that they are guaranteed ongoing subsidies even if they aren't eligible for any under the new CfD rules.

After 2027 the Government plans to transfer projects which are still being subsidised through ROCs to a new “Premium Feed in Tariff system” to get subsidies for another ten years. However, this is not set out in legislation, and policy may well change in the meantime.

3. CfDs and biomass electricity

Dedicated “biomass combined heat and power” (CHP) plants will be eligible for £125 for each MWh whilst biomass conversions (coal-to-biomass) will qualify for £105 per MWh, to be increased with inflation. By comparison, onshore wind will get £95 per MWh, reduced to £90/MWh in future and solar PV will initially attract £120/MWh, but that will be gradually reduced to £100/MWh.³ By means of another comparison, DECC has also announced that EDF's Hinkley Point C nuclear power stations will receive a strike price of £92.50/MWh.

This means that a power station conversion like Drax will be treated even more favourably than new nuclear power, despite the fact that the capital costs are much lower, and indeed the required finance for the conversion has already been fully met.

This level of support shows just how desperate the UK Government is to make biomass electricity a significant part of its “renewable energy” capacity.

Biomass power stations not classed as ‘CHP’ will not be eligible for subsidies under the CfD scheme, although, if they are awarded subsidies under the present Renewables Obligation by 2017, they will keep receiving those until 2027-37. However, as discussed below, the Government's definition of CHP is so wide that power stations don't even need to distribute any heat to qualify!

So far, MGT Power's Teesside plant has received an early guarantee of a CfD as dedicated biomass with CHP, and Drax units 2 & 3 and RWE's Lynemouth have been guaranteed CfDs

2 <http://www.carbonbrief.org/blog/2013/10/green-bills-small-portion/>

3 https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/263937/Final_Document_-_Investing_in_renewable_technologies_-_CfD_contract_terms_and_strike_prices_UPDATED_6_DEC.pdf

as coal-to-biomass conversions. Initially Eggborough was also included in this list, but was later removed with a further decision expected in 2014.⁴

Note that Drax Unit 1 and the fully-converted Ironbridge (provided E.On applies for and gets long-term planning consent for it beyond 2015) will continue to be subsidised under the ROCs scheme long-term.

How meaningful is the exclusion of electricity-only biomass power stations from the new subsidies regime?

DECC's decision to exclude electricity-only biomass power stations from the new subsidies mirrors a previous decision by the Scottish Government to only pay ROCs for biomass power stations larger than 15 MW if they are accredited as CHP.

In theory, this should be positive news: New-build electricity-only biomass power stations are on average less than 30% efficient - only the largest ones might reach 35%. Biomass CHP plants, on the other hand, can be 70-90% efficient. Furthermore, the most efficient CHP plants are ones linked up to district heating networks and therefore they are less likely to be built at ports and thus to be large enough to rely on imports.

Unfortunately, this is not what DECC has in mind (nor for that matter the Scottish Government) and the CfD regulations offer no incentives to high-efficiency CHP.

Across the UK, CHP accreditation can be obtained for biomass power stations of any size that achieve just 35% efficiency and that make use of no more than a tiny fraction of the heat, possibly just for drying their own woodchips or pellets. Although more efficient CHP plants could still get CfD subsidies, the rules work against efficiency: Those are very generous subsidies paid per unit of electricity. Maximising efficiency requires maximising heat delivery. An efficient CHP plant would therefore generate less electricity from the same amount of biomass than an inefficient one - and thus get less subsidies.

Our fears that such a meaningless definition of CHP would be used as a means for allowing large-scale destructive biomass power stations have already been realised: DECC has approved MGT Power's massive 299 MW Teesside biomass power station (which will burn around 3 million tonnes of wood a year) without any credible published proposals for supplying any heat. And the Scottish Government has approved two large import-reliant biomass power stations in Grangemouth and Rosyth as 'CHP', one on the basis of questionable claims about a potential heat customer, the other without any apparent heat customer at all.

4. CfDs and other bioenergy

Biofuelwatch's understanding is that **bioliquids** (such as palm oil, rapeseed oil, tallow or tall oil) are excluded from CfDs and that no bioliquids electricity that comes online after 2017 will be subsidised. This is good news!

However, any bioliquids plants commissioned by 31st March 2017 will receive ROCs beyond that date. So far, however, virtually no electricity is being generated from bioliquids in the UK.

⁴ https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/263171/Final_Investment_Decision_Enabling_for_Renewables_Qualifying_Projects.pdf

Anaerobic Digestion (AD) makes biogas from sewage, slurries and food waste but also, potentially, from crops such as maize grown for this purpose. In Germany a great deal of agricultural land has been converted to growing maize for AD to make biogas, making biogas one of the main causes of biodiversity losses in the country as well as competing for food and feed. Experience in Germany has already demonstrated the effects of biogas subsidies which do not distinguish between waste and energy crops. Other countries such as the Netherlands have decided to only subsidise biogas from certain types of waste. The strikeprice for AD (with or without CHP) has been set at £150/MWh, falling to £140 by 2019/2019.

Advanced Conversion Technologies (Gasification and Pyrolysis) treat waste and biomass fuel to produce syngas and/or liquid fuels which can be used to generate electricity. There are serious technical problems with making pyrolysis or gasification work and neither has been used with biomass on a commercial scale in the UK as yet. However, there have been two waste gasifiers in the UK, both of which have experienced large numbers of technical problems and emissions limit breaches (thus putting residents' health at serious risk) and one has had its environmental permit withdrawn. In theory, gasification and pyrolysis should be more efficient than ordinary combustion, but in practice they so far tend to be even less efficient. The strike price for Advanced Conversion Technologies (with or without CHP) (with or without CHP) has been set at £155/MWh, falling to £140 by 2019/2019.

5. How much can biomass projects expect to benefit from CfDs?

Wholesale electricity prices currently sit around £45/MWh⁵, although this doesn't necessarily reflect what each generator will be selling electricity for either now or next year, as contracts between generators and suppliers vary and are often determined far in advance.

Dedicated biomass plants (with CHP)

MGT Power's planned Teesside plant will have a capacity of around 300MW and would operate for up to 8000 hours a year. They can expect around £108 million from the wholesale price, and £300 million on the strike price, effectively meaning that they will receive subsidies of £192 million per year. This will rise in line with inflation, and assumes a consistent wholesale price.

Conversions

Drax Units 2 & 3 each at 660MW and assuming 7000 hours of operation a year will together receive around £495 million in subsidies a year. Including ROCs, i.e. subsidies paid under the current scheme for Unit 1, Drax can expect to receive a total of £694 million a year in subsidies.

Lynemouth, at 420MW, would receive £158 million a year if RWE decide to go ahead with this conversion.

6. So what will total subsidies for coal-to-biomass conversions be?

No one knows which conversions will be proposed next and which will go ahead in future. So far, only Drax has announced that they definitely intend to proceed. E.On has already

⁵ <http://www.theengineer.co.uk/opinion/viewpoint/pricing-up-power/1017677.article>

converted Ironbridge to biomass but they have not yet announced if they will apply for the planning permission required to keep it open beyond 2015 (note that Drax will not require any new planning consent to stay open, unlike Ironbridge). Tilbury B, the first power station to convert, has closed and the owners of Rugeley Power Station recently announced that they wouldn't be proceeding with a conversion despite having applied for permission to do this.

RWE say that they will announce in the next few weeks whether or not they will convert Lynemouth Power Station to biomass, for which they already have planning consent.

Eggborough Plc have complained that they may simply close the power station because the Government has not given them the early CfD promise they had wanted – but it is not clear whether they really intend to shut down the plant or are simply pushing for more subsidies. A possible sale to a Chinese energy company has also been reported, and that company's intentions are not known. However, Eggborough has no permission to continue operating as a coal power station beyond 2015.

As it currently stands, these are the figures for conversions expected to go ahead, or already operating:

- **Drax** Unit 1 at 660MW under ROCs gets around £43/MWh, so for a year of 7000 hours of generation that's £199 million per year. In total Drax will be looking at £694 million in subsidies a year. When you consider that their conversion is costing £700 million, these subsidies will indeed look very attractive to investors. Furthermore, Drax, has been given a public loan guarantee for £75 million and a cheap loan from the government-owned Green Investment Bank of another £50 million;
- **Ironbridge** at 1GW capacity could get £301 million per year, but in reality has produced far less electricity than it has been capable of since it converted to burning biomass;
- **Lynemouth**, at 420MW, would receive £158 million a year if fully converted to biomass;
- **Eggborough**, according to its owners, is still intending to convert. Should it qualify for CfDs in the next allocation round, it will be looking at £563 million a year for 1.5 GW of converted capacity.

All guaranteed and current levels of subsidy for coal-to-biomass conversions so far announced come to a total of £1.153 billion per year (assuming wholesale prices stay where they currently are, and excluding Eggborough). And this figure does not account for strike prices for large, inefficient import-reliant new biomass power stations.

If this amount of money was instead spent on home efficiency and other energy saving measures, it could have a real positive impact on carbon emissions and quality of life – rather than increasing carbon emissions, destroying forests and polluting the air. Yet the Government has been cutting back on its financial support for home insulation and other efficiency measures and has announced plans to abolish an obligation on energy companies to invest in efficiency.