Coal-to-biomass conversions: Supplementing one (climate) disaster with another?

Which UK coal power stations are to be converted to biomass and how much wood will they be burning?

Planning consent has been granted for five power stations to convert, either partly or completely, to biomass:

- Tilbury B (RWE Npower): Converted to 100% biomass late 2012, about to be expanded to burn pellets made from up to 6.8 million tonnes of green wood a year
- Ironbridge (E.On): Permission to convert to 100% biomass, which would require pellets made from up to 7.9 million tonnes of green wood a year;
- Drax: Drax has so far burned more (imported) wood than any other UK power station and they are about to convert half their power station to biomass, which will require pellets from up to 15.8 million tonnes of green wood a year;
- Eggborough: They have planning permission to convert to 100% biomass (though work has not yet started) and would need pellets from as much as another 15.8 million green tonnes of wood a year;
- Alcan Lynemouth (recently bought by RWE Npower): Planning consent to convert to 100% biomass, RWE will shortly announce whether they will go ahead with that. They would need pellets from up to 3.3 million tonnes of green wood.

(Note: Figures calculated on the assumption that the power stations would not run non-stop but for 7,000 hours a year.)

Altogether, those five power stations would need over 24.7 million tonnes of pellets made from almost 49.5 million tonnes of green wood. By comparison, total UK wood production is only 10 million tonnes annually. And total global wood pellet production was just 14 million tonnes in 2010 – which is why energy companies are now heavily investing in pellet plants overseas.

Where will the wood come from?

Virtually all of the wood will be imported. So far, most imported pellets come from Canada and the southern US, some from the Baltic States, Russia and Portugal In Canada and the southern US, highly biodiverse forests, including old growth ones, are being clearcut to produce pellets for our power stations. RWE, E.On and Drax are all investing heavily in large new pellet plants in North America, which are primarily using wood from whole trees felled for that purpose[1].

Across Russia, the Baltic States, the Mediterranean countries and Scandinavia, too, the last biodiverse forests are being destroyed and often turned into tree monocultures and this trend will get worse as biomass electricity demand grows. In the longer term, energy firms are looking at imports from Brazil, West and Central Africa and other

[1] www.dogwoodalliance.org/2012/11/new-report-discredits-uk-energy-company-claims-that-pellets-come-from-wood-waste/

regions of the global South, where trees grow faster. This will mean more land-grabbing, less food sovereignty and food security and, directly or indirectly, more destruction of tropical forests.

Climate impacts:

Power stations burning wood emit around 50% more carbon than ones burning coal.[2] Companies and policy makers ignore this carbon, claiming that new trees will grow back and absorb the carbon emitted from cutting down and burning mature ones. Yet it tends to take decades – 70 years for UK conifers – before that can happen. And when forests are destroyed and turned into monoculture plantations, much of that carbon will simply stay in the atmosphere. Such a carbon spike is a disaster at a time when scientists have shown that emissions must be reduced rapidly if we want to have any hope of avoiding the worst impacts of climate change.

Local impacts:

Burning biomass in power stations causes similar levels of air pollution as coal burning overall. It emits less sulphur dioxide (SO_2) but more very fine particulates (PM 2.5, which pose a particularly serious risk of lung and heart disease and for which there is no safe level, according to the World Health Organisation) and more harmful Volatile Organic Compounds. By far the main air quality concern, however, is that biomass conversions will allow power stations which would otherwise be shut down to operate for decades to come. Communities such as those around Tilbury B and Ironbridge will thus be exposed to high levels of air pollution for much longer. Furthermore, conversion to biomass greatly increases the risk of accidental fires and explosions.

What is behind the UK's coal-to-biomass conversions:

There are two reasons why big energy companies are investing in such conversions in the UK:

Firstly, they have been able to persuade the Government to grant generous subsidies, paid as Renewable Obligation Certificates. If the five conversion plans go ahead, they will attract at least £2.4 billion in subsidies every year.

Secondly, UK coal power stations emit more sulphur dioxide (SO_2) than those in any other EU countries. All of the power stations to be converted either fail EU air quality regulations in respect of sulphur dioxide (SO_2), or will fail them from 2016. Burning biomass is a subsidised and thus lucrative way of reducing SO_2 emissions from power stations. Tilbury B and Ironbridge would legally have to close before the end of 2015 unless they can drastically reduce their SO_2 levels. Drax and Eggborough are meeting EU requirements only because they are buying 'SO_2 permits' from others and they will no longer be able to do so from 2016. Their options are to close their old, polluting power stations, or to invest hundreds of millions of pounds into SO_2 scrubbing (something they have refused to do so far), or to convert, at least partly, to biomass.

Biomass conversion thus allows energy companies to keep their old, polluting power stations running for much longer, rather than having to shut them down or invest in highly expensive technology for reducing SO_2. And by converting to biomass, they will cash in on billions of pounds of public subsidies every year.

A replacement for coal – or a way of keeping old, polluting power stations running for longer?

[2] This figure is not contested – it is confirmed for example in permitting details for biomass power stations by the US Environmental Protection Agency. See http://www.pfpi.net/carbon-emissions

Energy companies are not investing in biomass conversions because they want to burn less coal. RWE for example is investing in far more new coal capacity in the Netherlands and Germany than it is trying to replace with biomass in the UK. Without the conversions, several large coal power stations would have to be closed down imminently – biomass is thus not an alternative to coal but to closing down power stations. In fact, partial biomass conversion is likely to allow some to also burn coal for much longer than they would otherwise have been able to. Stopping the conversions would reduce the UK's old, inefficient, polluting and high-carbon power station capacity, and thus create real incentives to cut energy use and invest in genuine renewable energy.