Case Study 7. Drax in the UK: subsidies for burning coal and increasingly more and more wood from overseas - *by Almuth Ernstig, Biofuelwatch, United Kingdom*

The UK's Drax coal power station, located in North Yorkshire, is burning more coal than any other plant in the country—and now more wood than any other power plant in the world. Drax—owned by a company with the same name—was opened in 1974 and, with a total capacity of nearly 4 gigawatts (4,000 megawatts), remains the EU's second biggest coal power station. So far, Drax has converted one out of six units to burning wood and is in the process of converting a second. They are committed to converting three units overall and are even considering converting a fourth.

What does this means in numbers? Running just one of Drax's six units requires 2.5 million tonnes of wood pellets – three units would thus require 7.5 million tonnes. And each tonne of pellets is made from two tonnes of freshly cut wood (called 'green wood'). The UK's annual green wood production is on average 10 million tonnes a year. Thus Drax alone wants to burn 1.5 times as much wood as is currently produced domestically. This is in addition to burning 3.7 million tonnes of coal, a figure that will also increase if their plans for a new coal power unit with Carbon Capture and Storage (CCS) are realised. Much of their coal comes from the Cerrejon mine in Colombia,[1] in an area from which small-scale Afro-Colombian farmers were brutally evicted 13 years ago.

Wetland cut w/ visible Cypress stumps. Photo courtesy: Dogwood Alliance.

Of all the EU countries, the UK has seen the most explosive growth in wood pellet burning—from 176,000 tonnes in 2010 to an estimated 5 million tonnes this year.[2] In other words it has increased by a factor of 28 in just four years.

The UK accounts for a quarter of all the wood pellets burned in the EU—though not a quarter of all wood-based bioenergy in the region, since other countries will be burning a larger proportion of wood in the form of woodchips and briquettes. Pellets are far less bulky and thus cheaper to ship than other forms of wood, and wood pellet trading therefore makes up the vast majority of the long-distance international trade in wood-based bioenergy. Most of that trade currently consists of pellet exports from the southern US and Canada to the EU, with the UK being the single biggest importer of North American wood pellets.

Political context

The reasons for the UK's pivotal role in the fast-growing international trade in wood-based bioenergy come down to government policies and subsidies.

Meeting EU renewable energy targets while curbing the expansion of onshore wind turbines (unpopular with many rural communities and especially with members of

[1] http://londonminingnetwork.org/2014/08/cerrejon-coal-the-best-mine-in-colombia/

[2] http://gain.fas.usda.gov/Recent GAIN Publications/Biofuels Annual_The Hague_EU-28_7-3-2014.pdf

parliament from the main party in the UK's coalition government) has been one of the government's key motivations

for supporting large-scale wood burning. The other motivation is their—and energy companies'—aim of keeping old, polluting coal power stations open.

Renewable energy subsidies in the UK currently favour energy from biomass. Indeed, across the EU, the lion's share of the 20% overall renewable energy target for 2020 is expected to be met from bioenergy, mainly burning wood. In the UK, the majority of renewable energy subsidies have so far gone to the electricity sector, different to other countries such as Germany that burns vast amounts of pellets for heat, or Scandinavian countries that burn loads of pellets for combined heat and power. However the UK government has recently introduced subsidies for 'renewable heat', by which they primarily mean wood boilers, and this is now creating yet another new market for pellets. Burning wood in power stations has attracted generous subsidies for years, but recently those subsidies have been more blatantly skewed against onshore wind and solar power and in favour of large-scale biomass and (less problematically) offshore wind.

Overall, energy companies' published plans would see well over 60 million tonnes of green wood being burned in UK power stations, although not all published plans will be realised. Most of this would be from imports. Even before the biomass boom started, the UK was already 80% dependent on net imports for all the wood products consumed in the country. Any large-scale wood burning for energy will, whether directly or indirectly, lead to more imports.

With respect to keeping old power stations open, a significant share of the UK's power stations are supposed to close at the end of 2015 because they do not meet EU limits for sulphur dioxide (SO_2) emissions, and yet more face closure soon after, when even stricter EU limits for SO_2 and nitrogen dioxide emissions come into force. Drax is one of the plants that would not meet the stricter directive if it continued to burn coal alone. Converting all or part of a coal power station to burning wood pellets reduces SO_2 emissions, even if burning wood is overall as polluting as burning coal. For Drax Plc., a 50% conversion to biomass is a way of keeping their power station running—and a very lucrative one at that. Once the third unit has been converted, their subsidies—paid via the general public's electricity bills—will jump from around €270 million to €858 million a year. They have also been awarded a €95 million public loan guarantee and a €64 million loan from the government-owned Green Investment Bank. On top of this are the public funds already obtained for their planned new coal power station unit with Carbon Capture and Storage (CCS)–so far up to €300 million from the European Commission, with hundreds of millions of pounds in additional UK subsidies a year expected.

Impacts

The only type of biomass which can be burned in a coal power station such as Drax is powdered wood pellets made from slow-growing trees.[3] Residues tend to have a high bark content which, just like fast-growing biomass, contains so many alkali salts that it would corrode the boilers. Slow-growing hardwood trees appear to be more suitable than wood from faster-growing conifers that are widely grown on plantations. Drax has entered into long-term supply contracts with three US and two Canadian pellet producers and they are

[3] Ibid

in the process of building their first two fully-owned pellet plants in Mississippi and Louisiana. Canada holds the sad world record of destroying its 'intact' forests the fastest.[4] The growing new demand for wood pellets can only worsen the devastation already caused by scarcely regulated industrial logging. In the southern US, the vast majority of the region's forests has long been destroyed—with many of them having been converted to monoculture pine plantations. Yet the remainders include some

of the most biodiverse subtropical ecosystems on the planet. Amongst them are the coastal swamp forests, also called bottomland hardwoods, of North and South Carolina—from which Drax's supplier Enviva sources wood for pellets. Dogwood Alliance has published evidence[5] of the clearcutting of those swamp forests, primarily for pellets (see also Box 4). They have also shown the environmental injustices inflicted on local communities by Enviva pellet plants.[6] These include excessive noise and traffic, and pollution and wood dust exposure. The latter is particularly worrying. Wood dust is a known carcinogen and exposure to it is associated with a range of other health risks too, such as skin disease, increased incidents of asthma attacks and chronic bronchitis and nasal problems.[7] Drax's own pellet mills in the southern US are still under construction but both are located near highly biodiverse native hardwood forests, including cypress forests.

Active Enviva bottomland hardwood cut. Photo courtesy: Dogwood Alliance.

Drax's is Europe's largest-scale single investment in biomass in general and in burning wood in coal power stations in particular—though by no means the only one. E.On, for example, has also converted a UK coal plant to biomass, although the company has indicated that this may close at the end of 2015. E.On is in the process of converting another one in southern France, in spite of strong local opposition. And Ontario Power Generation's converted Atikokan Generating Station[8] is North America's largest biomass plant. What the experience with Drax illustrates well is the symbiotic relationship between coal and big biomass: the world's biggest biomass scheme exists partly to secure a 'future' for coal too.

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[4] http://news.mongabay.com/2014/0905-gfrn-morgan-ifl.html

[5] http://dia.dogwoodalliance.org/p/salsa/web/questionnaire/public/?questionnaire_KEY=1656

[6] Residents close to the plant have faced extreme an constant noise levels and bright lights. They have lived with sticky wood dust that coats cars, buildings and lungs in just a few minutes, as well as dangerous, heavy truck traffic.

[7] http://www.biofuelwatch.org.uk/wp-content/uploads/Biomass-Air-Pollution-Briefing.pdf

[8] http://www.opg.com/generating-power/thermal/stations/atikokan-station/pages/atikokan-station-biomass-conversion-project.aspx

Box IV. Enviva's Wood Pellet Mill in Ahoskie, North Carolina Threatens Endangered Ecosystems and Wildlife

Conversions of large coal-burning power plants to wood (co-)firing in Europe have resulted in the explosive growth of wood pellet exports from North America. Enviva, the South's largest exporter of wood pellets, sources wood for its pellet-manufacturing mill in Ahoskie, North Carolina, from clearcut wetland forests in the Mid-Atlantic Coastal ecoregion. This mill produces approximately 400,000 tons of wood pellets per year for export to Europe as fuel for electricity. Multiple scientific studies have shown that burning trees to generate electricity releases more carbon than burning coal. While there is some regional variability in their results due to variations in climate and forest type, all have concluded that most forest biomass is not carbon neutral and, in particular, burning whole trees in power plants increases carbon emissions relative to fossil fuels for many decades.

Enviva's Ahoskie facility sources wood from the Southeastern Mixed Forests and the Middle Atlantic Coastal Forests ecoregions, both of which have been designated as Critical/Endangered. Pine plantations generally provide poor wildlife habitat, and the biological diversity they support pales in comparison with the diversity found in natural forests. Remaining natural and seminatural forests in this landscape are highly fragmented. Much of the forested wetlands in the broad ecoregion from which Enviva is sourcing wood have already been lost to logging. The North Carolina and Virginia Natural Heritage Programs already consider these forests highly imperiled where soil conditions, periodic flooding, and the low commercial value of the often twisted and less desirable trees have made utilisation of wood product resources less profitable.

Enviva's pellet mill puts additional pressure on these forests, making clearcut logging and shorter-rotation harvesting of these remaining forests economically practical. Because of the relative importance of forested wetlands as anchors for remaining biodiversity across this broad landscape, increased industrial logging in these forests will have significant negative impacts. Restoring bottomland hardwood wetlands is challenging because of the long time frame necessary for these forests to mature and because altered flood patterns can reduce the future diversity of trees and plants when a forest regenerates. Forested wetlands play a vital role in maintaining both biodiversity and ecosystem services in this region, offering habitat for waterfowl, songbirds, black bear, and a variety of reptiles and amphibians while also providing services for communities such as improved water quality, flood storage, and the buffering of water flow during drought. This forest type occurs mainly in and adjacent to wetlands, both riverine and non-riverine. Hence, these forests are important for maintaining healthy populations of all kinds of aquatic animals, including economically important species such as fish and shrimp.

Wetland hardwood forests are also critical to the maintenance and recovery of songbirds and raptors deemed to be declining and vulnerable to continued losses. Many priority bird species (those that are threatened due to the degradation and/or disappearance of their habitat), including the Swainson's warbler, yellow-throated warbler, Wayne's black-throated green warbler, and prothonotary warbler depend on mature bottomland forests during their annual cycle. Some bird species demonstrate a negative response to any timber harvest in bottomland habitat including Yellow-throated Vireo, while other forest interior species, such as prothonotary warblers, can tolerate thinning but only if 60-70% of the canopy is left intact. Additionally, radar analysis of bird migration in the Southeast reveals that mature forested wetlands are disproportionately important stopover habitat for migrating land birds.

The main forest types available for pellets in the area surrounding Enviva's Ahoskie facility are Loblolly/Shortleaf Pine, nearly all of which are pine plantations and early successional stands (young forests), although it is not clear to what degree these stands will be exploited for pellets. This could mean that the remaining, more natural forest types in the region, which consist principally of Upland Oak-Hickory (concentrated toward the western edge of the Ahoskie radius), Bottomland Oak-Gum-Cypress, and Bottomland Elm-Ash-Cottonwood, could become candidates for logging for pellets. Less than one percent of the forests in the Ahoskie facility's sourcing region are protected from logging activities that would degrade native ecosystems. Increased use of these (more natural) forest types will lead to additional fragmentation of an already highly fragmented landscape, decreasing landscape integrity, water quality and flood storage, wildlife corridors and habitats, and recreational resources. At the same time, increased use of plantation pine will incentivise future conversion of the few remaining natural and semi-natural forests to intensive uses.

Source: http://www.nrdc.org/energy/forestnotfuel/files/enviva-wood-pellets-FS.pdf

Box V. Burning Biomass From Natural Forests For Energy Production in Australia - By Peg Putt, Markets for Change

The forest industry in Australia began to press for the establishment of wood burning power stations to generate electricity in the late 1990s. The major feedstock was to be sourced from natural forests. The industry creates substantial volumes of low quality logs through extensive industrial forestry operations conducted substantially by clearfelling, or in some places by modified clearfelling methods. At times, for example in the state of Tasmania, up to 95% of logs removed from the forest after logging have been categorised as 'pulpwood' residues, whilst less than 5% of the volume is sawlog for sawn timber production. The pulpwood is the proposed feedstock for power generation.

The electricity to be generated from burning wood from natural forests is categorised as 'renewable', although it would take many hundreds of years for such forests to grow again. Flawed carbon accounting rules (LULUCF rules for the Kyoto Protocol) and forest industry propaganda create an impression that such electricity generation is carbon neutral, whereas in reality some of the most carbon dense forests on the planet would release massive tonnages of carbon into the atmosphere. The impacts on biodiversity and other high conservation values caused by the logging destruction of the natural forests is also of serious concern.

Environmental campaigns have successfully forestalled the development of any large-scale forest burning energy plants, using a strategy of characterising the electricity as 'dead koala power', and successfully using public opposition to gain commitments from energy retailers not to purchase power from this source. Government policy settings at national and state level have also been an arena in which hard fought restraints on inclusion of material sourced from natural forests into the Renewable Energy Target have constrained government subsidisation—a necessary component of making such ventures financially viable.

We are now entering a new phase. This entails a new push by the forest industry for wood-fired energy production—either in electricity generation or by utilising the wood for liquid or gaseous fuels (especially for transport fuels). The woodchip export industry based on natural forests being shipped out of Australia to Japan has suffered a significant decline, and in the state of Tasmania suffered a near total collapse. Whilst this has been blamed on the work of the conservation movement other factors are also in play. The global financial crisis constrained demand, as has the poorly performing Japanese economy, whilst the advent of new sources of supply at lower prices and a shorter distance to market have also been important factors. In particular, woodchip from plantations in Vietnam and Thailand has substantially replaced the Australian trade with Japan and China. Australia cannot compete with the lower prices.

Hence the domestic forest industry is looking desperately for another way to utilise the vast majority of wood generated from logging natural forests in order to sustain its very survival. Without the income generated by these low value logs the industry is uneconomic. In fact even with a market for this product the industry is chronically reliant on government subsidies. Most natural forests subject to logging are on public land managed by state-based government logging agencies. They all tend to lose money and are propped up by the public purse. The continued environmentally destructive logging of Australia's natural forests paid for by taxpayers has been a long running source of conflict, which continues today. The forest industry wield enormous political power, but public opinion has been around 90% against woodchip exports, and is also very opposed to burning such forests for power generation.

The newly elected Australian government (one year old) was elected on a promise to incorporate burning of biomass from natural forests into the Renewable Energy Target. A recent report to government reviewing the Renewable Energy Target supported this course. (The review was conducted by a climate change sceptic.) The threat of industrial biomass burning is now immediate domestically. Another possible threat is the export of biomass from natural forests for energy production in north Asia—export to Europe is less likely due to transport distances. Thus the domestic energy policies of Japan and South Korea are of particular concern. We are currently investigating the likely demand from these sources, and it seems that Japan is the most clear and present danger as it struggles to rework its domestic energy policy and pulp companies increasingly move into energy production. Whole logs have already been exported from Australia and trialled for electricity generation, and the bioenergy industry in Australia is keen to establish an export trade in wood pellets.

***Note**: Currently Japan is sourcing the majority of its wood pellets from Canada, with impacts on natural forests there. The possibility that they may look south for supply if their energy policy takes on the biomass burning option in a big way is not only a potential problem for Australia—it has serious implications for the forests of south Asia.*