By Michael Kavanagh 10.15.13 London Financial Times

Case Study: Biomass Fuels Industrial Rebirth in the UK

Ironbridge, the 18th century birthplace of the Industrial Revolution, and Drax, the UK's biggest coal-fired power station, are helping to change the shape of the country's energy future.

Both sites were developed as centres of coal-based power generation because of their proximity to a fuel source that was then cheap and in plentiful supply. Both have now emerged as 21st century centres of eco-friendly biomass burning.

In the case of Drax, preparations are being made by the UK's biggest emitter of carbon dioxide for the conversion next year of the second of its six power generation units to biomass, predominantly pellets derived from woodchip culled from forests overseas.

A third unit is expected to switch from coal in 2015 under a plan requiring a $700m investment. Drax is western Europe's biggest coal powered station switching to imported biomass.

The switch of half of Drax's generating capacity to biomass requires specially-designed rail wagons, boilers and storage facilities. It will enable the plant to continue to operate as the UK's largest electricity producer, accounting for 7 per cent of the UK's supply on average, well into the next decade.

The story at Ironbridge, operated by German-owned power group Eon, is more complicated. The power plant, situated less than a kilometre away from the Ironbridge world heritage site, was scheduled to close under the terms of an EU directive aimed at limiting emissions from coal-fired plants.

Ironbridge, one of two biomass-fuelled plants operated by Eon in the UK, has been given a new lease of life by being converted to run on wood pellets. Even so, the plant is still scheduled to close by 2015.

But as Ironbridge prepares for closure Eggborough Power Station, another major UK coal-fired station based near Selby in Yorkshire, is planning to extend its use of biomass fuel stock that already includes items as exotic as olive pellets and olive cake. These are blended with the pulverised coal before it reaches the boilers.

Beyond the encouragement of co-mingling and biomass-dedicated conversions at the UK's largest coal-fired stations, a raft of smaller-scale biomass ventures are also scheduled.

Renewable energy company Eco2 recently confirmed it had won £128m in financing backing to build a power station in Lincolnshire that will be fuelled by straw and capable of generating enough energy to supply 70,000 households.

The company has already developed another state-of-the-art biomass plant designed to burn the large volume of dry stalk residue left from cereal farming in east England that complements another plant to the south of England's cereal belt operated by rival company Energy Power Resources in Ely, Cambridgeshire.

And last month the Western Wood Energy Plant near Port Talbot, south Wales, announced further financial backing and supply agreements to support expansion of a biomass burning unit fuelled on virgin and recycled wood waste supplied in part by the UK's Forestry Commission.

Ironically the drive towards increased co-mingling of coal biomass and investment in conversion of coal-fired generation units to biomass coincides with a fall in global coal prices. This has boosted imports of a fuel widely seen as being the least environmentally-friendly feedstock used by electricity suppliers.

But latest statistics released last month by the Department of Energy and Climate Change also pointed to a year-on-year jump, in the three months to June, of nearly 60 per cent in the contribution that bioenergy made to overall electricity supply. This includes the co-firing of biomass with coal across Britain's fleet of power stations,

In total renewables' share of the UK's electricity generation increased from 9.7 per cent in the second quarter of 2012, to 15.5 per cent in the second quarter of 2013. Biomass accounted for two-fifths of this total of 12.8 Terawatt hours supplied to the grid. Wind power contributed half of renewable output, with hydropower, solar, wave and tidal power schemes contributing the residue.

DECC attributed the jump in bioenergy output last quarter to the conversion of Ironbridge and switch of one Drax unit to biomass, along with the return of Tilbury B power station to operation after a fire earlier this year.

But Tilbury B, like Ironbridge, has stopped operating, despite its conversion to biomass. Its owner RWE Npower blamed the failure to secure sufficient subsidy to pursue its plan to keep it open for a further 10 to 12 years as a biomass burner.

The eventual scale of take-up of biomass power generation in the UK, then, remains uncertain and subject to the vagaries of government subsidies and guarantees.

But even if there is no hope for the UK to be self-sufficient in production of biomass fuel, proponents argue there is plenty of feedstock available globally, if not locally, to accommodate a further large switch away from fossil fuels should public policy allow.

A recent paper published by the US Department of Energy suggests that logging waste and other residue created by forestry husbandry in the US creates 93m tonnes of dry biofuel feedstock a year that could be used in preference to coal if processed for shipment to power plants domestically or abroad.

That volume of unexploited US wood waste dwarfs Drax's predicted requirement of 7m tonnes a year. Though much of Drax's supply is expected to come from outside North America, the company is investing in two pellet production plants in Mississippi and Louisiana and has also struck a long-term contract for the supply of pellets from pine wood killed by beetle attacks in western Canada.

Support for biomass power projects is not universal. Plans to expand the UK's use of biomass for electricity generation have been attacked by many environmental campaigners, who have warned of the dangers of overexploitation of forest habitats and possible disruption to local communities in developing countries caused by any switch to commercial biomass crops.

But the UK's Back Biomass Campaign, supported by the Renewable Energy Association, defends the green credentials of imported biomass fuel stock. It argues that, if properly culled and processed at source, the shipping of biomass in large volumes can be as equally carbon-efficient as transporting dispersed, locally produced biomass material by truck to generator plants.

But with Ironbridge and Tilbury set for closure, Drax and Eggborough are set to emerge as the two champions of large-scale biomass generation. The driver of any further expansion of biomass as a renewable energy source in the UK appears set to depend on further encouragement
– and subsidy – from government sources.