FOCUS ON COAL

GOING *underground*

Britain's coal mining industry is under threat. **THOMAS BRIGHT** visits one of the country's last remaining opencast pits to discover what the future holds for this vital resource.

Coal for locomotives may no longer be mined in Britain by 2022 or shortly afterwards.

Once remaining coal reserves in current sites have been extracted and stocks have been exhausted, we could be entirely reliant upon imports by the end of the decade.

That means British locomotives will not burn British coal for the first time in over 200 years. When Richard Trevithick's Pen-y-darren locomotive made its pioneering journey in February 1804 near Merthyr Tydfil in South Wales – in the heart of one of Britain's biggest coalfields – it cemented the binding and lasting relationship between coal and railways. The steam locomotive was born from the coal industry, and until the end of standard gauge BR steam in 1968, coal was crucial to railways' existence, not only powering trains to all four corners of the country but comprising the bulk of railways' traffic and revenue.

Now it seems that relationship is drawing to a close. Unless the Government grants planning permission for the creation of new mines, coal mining on any significant scale in Britain will cease within two years. In addition to the threat posed by the Department for Environment, Food & Rural Affairs' plan to phase out the sale of coal for domestic use – plus an increasing nationwide desire to dispense with coal altogether and embrace cleaner alternatives – this poses a very serious challenge to preservation's future. And it's a problem that cannot be easily overcome.

THE FINAL VOID

Have you ever wondered where coal comes from?

More specifically, have you ever wondered how this vital fuel gets from hundreds of feet below the ground and into the fireboxes of your favourite locomotives?

Coal is such an omnipresent part of railway furniture that we arguably take it for granted. Besides, does it matter where coal comes from, or how it gets there? Coal is coal, isn't it?

To find out, *Steam Railway* went to Shotton surface mine in Northumberland, approximately nine miles north of Newcastle-upon-Tyne city centre.

It is one of three pits owned and operated by The Banks Group, and is the largest surface coal mine in England, bordered by the major A1 road to the west and the East Coast Main Line to the east. More importantly for us, however, it is one of just three pits – in addition to Hargreaves' House of Water pit in Ayrshire and Merthyr (South Wales) Ltd's Ffos-y-Fran pit near Merthyr Tydfil – that supplies the preservation industry.

It won't for much longer, however. Shotton is coming towards the end of its operational life. Coal extraction is currently concentrated in the 390-feet-deep pit fittingly dubbed by the miners as 'the final void', and even this is already in the process of being filled in. By May of this year, all the coal will have been mined at Shotton and within a couple of years there will be scarcely any evidence there was a mine here – such are the lengths to which Banks goes to restore its sites once their useful days are over.

Normally, the miners would move on to a new site and carry on digging out coal. Compared to deep mines, surface mines like Shotton have more limited working

Coal's golden age. Lines of private-owner coal wagons in the Lancashire & Yorkshire Railway's coal storage sidings at Goole Docks on April 24 1911. Two years later, Britain would produce a record 287 million tonnes of coal. GETTY IMAGES/SSPL

lives, often operating for between five to ten years or so before production ceases, so organisations like Banks always have a development programme to bring forward new projects to replace exhausted sites.

The group has three potential sites – Bradley West, Dewley Hill and Highthorn – in the planning system, and is currently awaiting the outcome of a decision from the Secretary of State for Communities & Local Government over its planning application for the latter which, if approved, could yield up to three million tonnes over a planned five-year extraction period. However, it has been waiting for four years for planning permission, and there is no indication of when or if the Secretary of State will deliver the verdict.

Banks' other mines are Brenkley Lane in Northumberland – where coal extraction ceased in December – and Bradley, in County Durham, where production will cease by the end of this year, so if planning permission for Highthorn in Northumberland is not granted, and if both Bradley West and Dewley Hill similarly fail to receive planning consent, then the immediate future of coal supplies looks grim.

Not only will hundreds of skilled workers be made redundant but, more pertinently for the preservation movement, once the currently active sites cease production, those vital sources of supply will disappear.

This status quo is representative of the challenging climate in which Britain's coal mining industry – now but a forlorn shadow of its former self – finds itself in 2020.

COALS TO (AND FROM) NEWCASTLE

A century ago, coal was king. Without it, Britain could not have become the international industrial powerhouse that it was in the 18th, 19th and early 20th centuries. Coal was – quite literally – the rock upon which Britain's economy, industry and prestige were built.

Today, coal has been all but abandoned. The tipping point was, arguably, December 5-9 1952. For those five days, the 'Great Smog of London' enveloped the capital in a choking, sulphurous blanket, reportedly killing between 4,000 and 12,000 people directly and indirectly. The consequences of this disaster heralded the beginning of the end of Britain's hitherto unbridled love affair with coal and led to the introduction of the 1956 Clean Air Act – a piece of wide-ranging legislation designed to drastically reduce emissions from both households and industry.

Analogous to this was British Railways' 1955 Modernisation Plan which, among other objectives, sought to eradicate steam as a form of motive power, owing to "the growing shortage of large coal suitable for locomotives" and "the insistent demand for a reduction in air pollution by locomotives." Nothing changes.

Although many of Britain's coal-fired power stations were built post-1956, in recent decades, demand for coal has plummeted. Whilst the decline rapidly hastened after the infamous miners' strikes of the mid-1980s, the privatisation of British Coal in 1994 and the 'dash for gas' in the 1990s, as late as 2014, 50 million tonnes of coal was still being consumed by the power generation sector. Since 2015, with the increase in 'carbon tax' and the announcement that coal-fired power stations would close by 2025, the proportion of coal-fired generation has fallen to all-time lows.

Coal today is but a bit player in Britain's energy makeup. The Digest of UK Energy Statistics (DUKES) suggests that coal represented just 3.9% of the country's energy demand in 2018, and during May 2019, Britain went for a whole fortnight without directly burning a single lump of coal to generate power – although we imported coal-fired power from Europe during that period. Following the closure of Cottam in September last year, and once Aberthaw B and Fiddler's Ferry close at the end of March, there will be just four operational coal-fired power stations remaining in Britain (Ratcliffe, West Burton A, Kilroot and Drax, although the latter has been largely converted to burn biomass). By 2025, they will have all closed or been mothballed.

Banks has adapted to a changing UK market for coal. "Five or six years ago, about 90% of Banks Mining's output went to the power station market," says Banks Group projects director Barney Pilgrim. "Now, more than 60% of our production goes to the steel, cement, heritage rail, household coal and other industrial markets, and less than 40% goes to the power sector, and we expect this trajectory to continue."

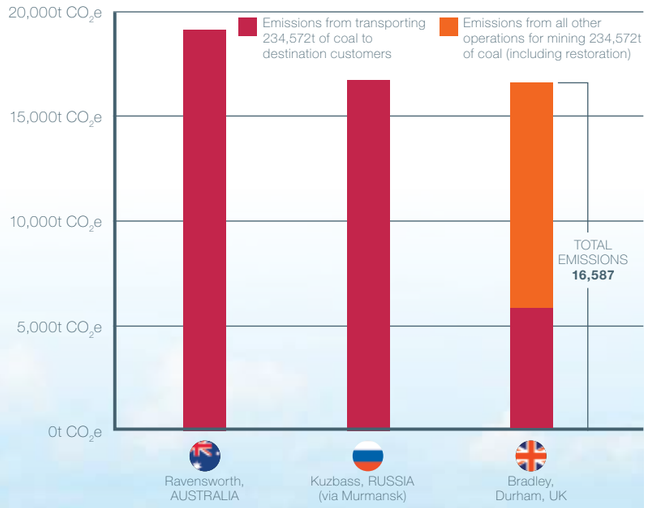
The "dark, satanic mills" so reviled by the poet William Blake may have been all but eradicated, but after 2025, the steel and cement-making industries alone will still require 5-6m tonnes annually – more than enough to sustain Britain's coal industry.

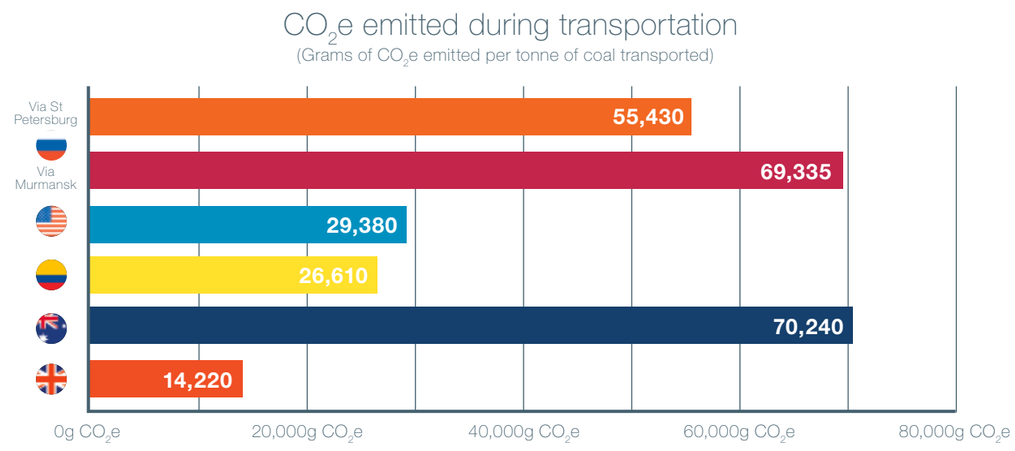
Barney says: "All the indicators are that there will be continuing demand from the industrial sector for the next 15 years at least, as raw steel and cement cannot be manufactured at scale without coal as a component for the foreseeable future."

However, given the recent and well-documented financial difficulties suffered by both the steelmaking plants at Scunthorpe and Port Talbot, there is no

The view of part of Shotton surface mine from the top of Northumberlandia. The lump coal preparation plant, just visible on the left, is dwarfed by mountains of pulverised coal. THOMAS BRIGHT/SR

The remaining coal (234,572 tonnes) from Bradley Surface Mine can be mined, transported and the site restored for less greenhouse gas emissions than just the transportation alone of 234,572 tonnes of coal from Russia or Australia. BANKS GROUP





guarantee that either will survive in the long term.

Beyond these, the remaining 'major' consumers of coal are domestic households – the market targeted by DEFRA's proposed coal ban – and the preservation movement, but these account for a mere fraction of the country's overall coal consumption.

To put this into context, the railways' annual coal consumption would account for just 1% of the total amount of coal mined in the UK in 2018, despite production falling to a record low of 2.6 million tonnes.

The contraction of Britain's coal mining industry has inevitably mirrored the fall in nationwide demand for coal. 2018's output was less than a tenth of that at the start of the century, and less than 1% of the record high of 287m tonnes produced in 1913. The majority of our coal is therefore imported – primarily from Russia but also from the USA, Australia and Colombia – with imports accounting for 80% (10.1m tonnes) of the UK's coal supply in 2018.

There are no deep coal mines left following the closure of Kellingley Colliery in North Yorkshire in December 2015, leaving less than ten operational surface mines – and even these are living on borrowed time, with all expected to close around 2022. There are also a handful of drift mines, but their output is either unsuitable for locomotive use, or of a negligible tonnage – usually not more than a couple of hundred tonnes per year.

It is not all doom and gloom, however. In March last year, Cumbria County Council granted planning permission to West Cumbria Mining Ltd to develop Woodhouse Colliery. Production is expected to start in around 2022 and, although the output will be coking coal for the steelmaking industry and therefore of little relevance or use to preserved railways, it nonetheless demonstrates that the Government is willing to welcome new mining initiatives.

But, even this light at the end of the tunnel is dim at best. According to the coal protest group, Coal Action Network, there have been no new opencast mines approved since January 2016, and the environmental lobby's voice is gaining strength at both societal and governmental levels, further renewing calls for Britain to take drastic measures in cutting its carbon footprint. With demand already falling at an alarming rate, coal is arguably seen as an easy target.

Therefore, one has to ask, what is the future of coal in Britain?

Britain's operational coal mines

SURFACE MINES

Mine	Location	Owner	To close
Bradley	County Durham	Banks Group	2020
Brenkley Lane	Northumberland	Banks Group	2020
East Pit	South Wales	Celtic Energy	CLOSED
Ffos-y-Fran	South Wales	Merthyr (SW) Ltd	2022?
Field House	County Durham	Hargreaves Services Ltd	TBC
Hartington Reclamation	Derbyshire	Tawnywood Ltd	TBC
House of Water	East Ayrshire	Hargreaves Services Ltd	TBC
Nant Helen Extension	South Wales	Celtic Energy	TBC
Rusha	West Lothian	Banks Group	CLOSED
Shotton	Northumberland	Banks Group	2020

Source: The Coal Authority

FROM PIT TO FIREBOX

For enthusiasts, there are two separate but linked threats facing coal: DEFRA's proposals to ban the sale of coal for domestic use, and – Woodhouse Colliery aside – the continuing lack of new planning permissions for new mines in the UK and recognition of the continuing need for coal. We'll return to these issues shortly.

Since extraction began at Shotton in 2008, the circa 400-hectare site has produced "high-quality, high-calorific, low-sulphur coal which has the right quality and characteristics for use in locomotives across the heritage fleet," explains Barney.

Current output is around 600,000 tonnes per annum, the main customers being the industrial sector, with only a relatively small fraction going to the heritage market. It is nonetheless one of Banks' growing markets, and in 2016, it invested £1m in a new coal screening and washing plant to produce coal for specialist markets.

Raw, unprocessed 'run of mine' coal is dug from the seam by excavator, deposited into a dump truck and taken up from the mining void to the screening and washing plant, which "separates sized fractions of product based on specific gravity and quality," explains Barney. "Lump coal is a relatively small part of the overall output of the plant, with the plant producing a range of singles, doubles, trebles and lump coal."

It is this relatively small aspect of Shotton's operations that DEFRA's proposals endanger. Barney says: "Surface mining operations would continue to be able to supply the enduring industrial markets such as steel or cement," but, he adds, "the production of lump coal is a niche operation, as it is a relatively small proportion of the total production. Not having the household coal element would make this far more difficult."

CHALLENGING CLIMATE

However, this potential crisis pales into insignificance compared to the continued lack of planning permissions for new coal schemes in the UK. This arguably poses a greater threat to both Britain's coal mining industry and railways' supply of coal because, if new coal mines are not approved, DEFRA's proposals become somewhat irrelevant.

As previously mentioned, even after the collapse in demand from the power generation sector come 2025, there will still be an annual demand for around 5-6m tonnes of coal in Britain for at least the next couple of decades, and "there is a sustainable market opportunity for UK mined coal to continue in the supply mix for the UK industrial coal needs," says Barney.

However, he adds: "The challenge to being able to supply the industrial market with British-mined coal is by and large a planning-related issue. The delays that we have experienced in bringing forward new consented coal reserves is mainly as a result of the significant delays in gaining planning permissions for new mining facilities, with Highthorn being a classic example.

"Time is now critical for gaining a positive Highthorn planning decision to ensure continued supplies of much-needed British-mined coal to the UK industrial and heritage rail sectors. While there will always be the need for some importation, we believe that the majority could be supplied from new British mines in the planning system."

The Government wants to achieve net zero national carbon emissions by 2050, but given that coal will still be required by important industrial sectors in fairly significant quantities for at least the next 20 years, surely coal mining in the UK is the more environmentally sustainable option?

"The key question is: does Britain just want to rely on imports of coal and export jobs, decrease the security of supply, and all at increased global greenhouse gas emissions, or support a well-regulated, and sustainable British surface mining industry?" posits Barney.

"Our research shows that the greenhouse gas emissions generated by the transportation of these imports, from Russia to UK customers, are between four and five times higher than transporting British-mined coal from Dewley Hill to Port Talbot. The increasing use of imports doesn't just 'off-shore' the UK's climate change responsibilities, it increases greenhouse gas emissions without the significant local economic and employment opportunities and environmental enhancements that indigenous coal production delivers.

"British coal can be mined, transported to market and sites restored for far fewer greenhouse gas emissions than just the transportation element of importing a similar volume from Russia, and is therefore far better for the environment. Our mining operations also produce significantly fewer greenhouse gas and methane emissions than most overseas mines.

"We must look at emissions in a global context and not simply close down UK industry and import the minerals and products we need from far away suppliers, thus creating even more CO2 emissions. To close indigenous mines and then import more coal is worse for the planet, virtue signalling and, frankly, hypocritical."

Banks is acutely aware of its environmental responsibilities; its motto is 'development with care'. Take Shotton as an example. Even if you drive right past the front gate, you'd barely notice it, and there is also scant evidence of its existence from either the neighbouring A1 road or ECML.

The only chance you have of seeing the mine's operations is if you climb to the top of the adjacent Northumberlandia landform project. Resembling a female figure in repose, this was built by Banks using overburden material extracted from Shotton and opened by the Princess Royal in 2012 as a legacy for future generations. It is fascinating to stand here and watch work taking place – the enormous dump trucks ferrying overburden and tipping it into 'the final void', the smaller trucks carrying coal up from the pit to the washing plant… It is riveting and made all the more so by the knowledge that all this activity is coming to an end.

Banks has also diversified its operations, and in 2006 it established a renewable energy division which "now supplies 224MW of onshore wind power in England and Scotland. The amount of carbon displaced from the UK electricity grid by the production of this renewable energy is greater than the greenhouse gas emissions from our entire business, including the emissions from mining business," says Barney. In other words, Banks is 'carbon negative'.

Britain's railways have been inextricably linked with the coal industry for centuries. Hunslet 'Austerity' 0-6-0ST Works No. 3839 *Wimblebury*, banked by classmate Works No. 3694 *Whiston*, tackles the 1-in-19 Foxfield bank with a typical coal train during a photo charter on December 29. JOHN BARRANCE

He adds: “Over the last 40 years, Banks has planted some 1.2m trees in our restoration schemes, as well as creating large areas of non-agricultural habitats for nature conservation, and so delivering net environmental gain from our projects.”

An example of this careful and comprehensive restoration work can be found not far from Shotton in the extensive grounds of Blagdon Hall. This was once Banks’ Delhi surface mine but is now prime country estate parkland; restored as an attractive Capability Brown-style landscape replacing the rather pock-marked and undulating landscape that was left by NCB mining operations on this site after the Second World War.

At Shotton, the company has gone to great lengths to reduce the mine’s impact upon the environment. Water sprays keep dust to a minimum, vehicles and other plant machines are modified on-site to reduce noise and emissions, and lorries pass through a wheel-wash so they don’t drag detritus from the mine onto the main road. There are seismographs, dust monitors, wind monitors, noise monitors… a multitude of methods to minimise disruption to the community, wildlife and environment.

Despite the professionalism and pride in their work on show, there is nonetheless an air of tension as the miners await the CLG Secretary of State’s decision on Highthorn. Their future hangs in the balance and there is a sense of melancholy that Shotton’s life is drawing to a close, with no guarantee of a successor.

There is also a somewhat uncomfortable elephant in the room that, nonetheless, must be addressed: are we merely staving off the inevitable? Even if Highthorn, Dewley Hill and other proposed surface mines do get planning consent, we’ll be back to square one in a few years when they too cease production. What then?

Given the current difficulties in getting Highthorn and others approved, there is no guarantee that the government of the time would be any more receptive to the idea of new coal mines, so even if DEFRA abandons its plans, without new planning permissions, we might be reliant on imports within a decade anyway by default.

> “If we want to keep the fires burning and the wheels turning, now is the time to support our coal industry.”

This need not be the case. There is clearly a strong environmental argument for the Government to support Britain’s coal industry. The country will still need a significant amount of coal in the future, so why import it from overseas – with all the greenhouse gas emissions such transport entails – when it could be mined right here in Britain? It’s a win-win situation.

COAL IN LIMBO

The next few years are, therefore, going to be critical, not only for preservation’s coal supply but Britain’s coal industry as a whole. While it is clear there will still be sufficient national demand from the industrial sector to sustain Britain’s coal mining industry for at least the next few decades, without governmental support for indigenous coal production, British coal remains in limbo.

Unless Banks and other coal producers are granted planning permission for their proposed new mines, it could well be that, within a few years, there may be no British coal available for British locomotives.

Importing coal is likely to be more expensive than domestic supply, a different quality to domestic coal, and harder to ensure it is the correct size when it is brought in by sea in large shipments.

If we want to keep the home fires burning and the wheels turning, now is the time to support our coal industry. Our industry, our hobby, our passion depends upon it. SR

For how much longer will we be able to enjoy views such as this? ‘78XX’ No. 7828 *Odney Manor* steams away from Blue Anchor with a Minehead-bound train on December 30, during the West Somerset Railway’s Winter Steam Festival. TOM NOBLE