

UK ELECTRICITY: CLEAN COAL OR DIRTY GAS – A CLEAR CHOICE

Introduction

Coal offers unrivalled advantages as a fuel for electricity generation and is widely available from many countries, including the UK. It is moderately priced, flexible in use and can be easily stored. Above all, it is secure and continues to provide a baseline fuel for the UK's electricity production. But it is also the most carbon intensive fuel.

Coal producers have known for many years that the long term future for coal as a fuel for electricity generation depends on emissions from coal-fired plant being decarbonised. However, the same must apply for other carbon intensive fossil fuels. The Committee for Climate Change state that electricity generation must be radically decarbonised by 2030 if the UK is to meet its target of an 80% reduction by 2050.

By far the most promising and economic technology for decarbonising electricity generation from fossil fuels, including both coal and gas, is carbon capture and storage (CCS). Each of the elements, capture, transport and storage, has been proven and is operating at commercial, albeit small scale. There has been no large scale CCS generation project and demonstration of the combined technology at commercial scale is required for it to become technically proven. The expected costs of CCS are competitive with most other low carbon technologies for electricity generation and it will enable the world to continue to make use of its large fossil fuel resources but in a way that minimises carbon emissions.

However, two policy measures, one a European Directive and the other the UK Government's policy for clean coal, threaten the future for low carbon coal-fired generation and would lead the country into an overwhelming dependency on unabated, potentially insecure, expensive gas, particularly when unreliable, intermittent generation from renewables is not available.

The Industrial Emissions Directive (IED) could, in the absence of other measures, place indigenous coal, which has a relatively high sulphur content, at a severe disadvantage compared with imported coals. Worse still, an over-reliance on unabated gas will make it impossible for the UK to attain its carbon reduction targets.

Proposed European Emissions Directive (IED)

The IED requires significant reductions in emissions of sulphur dioxide (SO_x) and nitrogen oxide (NO_x) from coal-fired plant from 2016 onwards. To avoid a cliff edge at the end of 2015, the European Council and Commission have agreed on a series of flexibility measures. First, Transitional National Plans (TNPs) will be allowed whereby Member States can, within national ceilings, reduce emissions more gradually so that the new limits do not have to be reached until 2020.

Second, individual power plants can opt out of the new limits provided that they operate for no more than 17,500 hours after the end of 2015 and close by the end of 2023. Additional flexibility measure will permit higher sulphur indigenous coals to be burned provided the power plant's flue-gas desulphurisation (FGD) installation can remove a minimum of 96% of SO_x, and will permit some peaking plant to continue to operate provided they do so for no more than 1,506 hours a year.

In order to comply with the IED existing coal-fired power plants will need to invest significant sums to meet the limits for NO_x if they are to be able to continue to operate at high load factors. Most of them would also have to invest in updated FGD installations if they are to be able to burn high sulphur indigenous coals without restrictions.

There must be major doubt as to whether power plant owners will be prepared to invest such sums at these ageing plants, particularly as they are in any case disadvantaged by the carbon trading regime of the European Union's Emissions Trading Scheme.

There is the potential therefore that most of the UK's existing coal-fired power plants will close by the end of 2022. Any that remain may not be able to burn indigenous coals without restriction.

The UK Government's Clean Coal Policy

The potential demise of all or a large part of the UK's existing fleet of coal-fired power stations would not be a problem for a secure, diverse energy economy if they were to be progressively replaced with new, high efficiency stations equipped now, or retrofitted by the early 2020s, with carbon capture and storage to achieve near zero carbon emissions. If fitted with best available technology FGD equipment, such stations could also burn UK higher sulphur coals without restriction.

The Government's clean coal policy represents a way forward for coal-fired generation only if part of a wider approach to apply the full CCS chain to all new fossil fuel plant. Government policy now requires all new coal-fired plant to be CCS equipped from the outset for a large proportion of the plant, with the clear expectation that CCS will be fitted to the remainder of such plant by 2025.

CCS on coal-fired plant will only become economically viable if it is the recipient of public funding from some source, or if it is one of a suite of policies that creates a level playing field and requires all new electricity generation plant, including gas, to be near zero in terms of carbon emissions.

There is no such requirement for new gas-fired plant other than that it must be constructed CCS ready. In these circumstances, investors will clearly fund new unabated gas plant in preference to any CCS equipped coal-fired plant which is not the recipient of public funding.

As a consequence of this policy, it is highly probable that few new coal-fired plants will be constructed to replace the existing coal-fired plant likely to close as a result of the IED. Coal-fired generation will fall dramatically and the UK will become highly dependent on gas, particularly on a cold, still winter's day. A secure, diverse, moderately priced

electricity generation portfolio will be replaced by one subject to serious security of supply and price risks.

Worse still, the overdependence on unabated gas plant will lead to much higher carbon emissions than would otherwise be the case. The amount of new unabated gas plant recently completed and presently under construction means that the target of a largely decarbonised electricity generation system by 2030 is already unattainable.

Is there a solution?

Coal producers strongly support the Government's approach to CCS on coal-fired power plant. If applied to all new fossil fuel plant, including gas, this will lead to a secure, diverse, relatively low cost, low carbon future for electricity generation, the best of all worlds. But unless there is an end to the free ride that unabated gas plant presently enjoys, the consequence will be an electricity generation portfolio with severe security of supply and price risks and still high carbon emissions, the worst of all worlds.

The answer is to apply the same rules to new gas plant as presently applies to new coal plant. New gas plant should require to be constructed partially equipped with CCS with the clear expectation that CCS will be retrofitted to the rest of the plant by the early 2020s. Unabated gas plant which has been constructed CCS ready should also be expected to retrofit CCS by the early 2020s. Coal producers accept that if public funding is available to some new CCS coal plants, it should also be available to some new CCS gas plants.

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