Closing UK unabated coal: coal-fired generation should end by the close of 2020

The recently announced cross-party agreement to end the use of unabated coal in the UK is a significant development, and one full of symbolism. The first industrialised country has become the first major economy to commit to weaning itself off coal. Party leaders must now decide on the appropriate timing for the phase out and which policy instruments to use.

To limit global emissions to a level consistent with a 2°C future the International Energy Agency (IEA) estimated in 2013 that it will be necessary to close 290 GW of subcritical coal generation worldwide by 2020.[1] Subcritical is the least efficient and most polluting form of coal-fired generation and accounted for a staggering 8.6 $GtCO_2$ of emissions globally in 2009.[2] For context, in 2010 net atmospheric emissions were around 22 $GtCO_2$ per annum.[3] In addition to the average subcritical power station generating 1.75[4] times as much carbon pollution as the average advanced ultracritical (the most up-to-date form of coal-fired power station), they also use 1.67[5] times more water.

The UK's coal generation capacity in 2012 was 28 GW[6] and this was entirely subcritical, accounting for approximately 18% of the EU's total subcritical capacity[7]. Permanently closing this capacity would contribute 10% to a 290 GW by 2020 global closure target. Fortunately for policy makers, since 2012 approximately 9 GW of this capacity has already closed, leaving the UK with nine subcritical power stations with 19 GW of capacity[8]. The rapid pace of recent closures shows how a 2020 coal closure programme is doable and this would undoubtedly make a significant contribution to international climate change mitigation efforts.

Doing so would also generate important co-benefits. In addition to tackling the most significant source of carbon pollution, premature closure would address the estimated 1,600 premature deaths caused annually by air pollution from UK coal-fired power stations.[9] These power stations also rely on thermal coal imported from Russia - with around 44% of our coal coming from that increasingly unreliable partner.[10]

Another reason why a 2020 coal closure plan is urgently needed, is that if advanced economies with old and inefficient subcritical assets, like the UK, Germany, and the United States, do not act first to close these power stations, we cannot expect China, India, South Africa, or Indonesia to follow suit in a timely fashion. The world's climate future really does depend on what these countries do with their much newer

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[1] International Energy Agency, *Redrawing the Energy Climate Map* (Paris, OECD/IEA, 2013).
[2] Carma and Enipedia 2015
[3] Le Quéré, C., Raupach, M.R., Canadell, J.G., Marland, G., Bopp, L., Ciais, P., Conway, T.J., Doney, S.C., Feely, R. A., Foster, P., Friedlingstein, P., Gurney, K., Houghton, R. A., House, J.I., Huntingford, C., Levy, P.E., Lomas, M.R., Majkut, J., Metzl, N., Ometto, J.P., Peters, G.P., Prentice, I.C., Randerson, J.T., Running, S.W., Sarmiento, J.L., Schuster, U., Sitch, S., Takahashi, T., Viovy, N., van der Werf, G.R., Woodward, F.I. (2009) "Trends in the sources and sinks of carbon dioxide," *Nature Geoscience*, 2(12), 831–836.
[4] International Energy Agency, *Redrawing the Energy Climate Map* (Paris, OECD/IEA, 2013).
[5] EPRI (2008). Water Use for Electric Power Generation.
[6] https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/170708/et_article_coal_in_2012.pdf
[7] Carma and Enipedia 2015
[8] DECC (2014). *Digest of United Kingdom Energy Statistics 2014.* (London, DECC, 2014)
[9] HEAL, 2013, see: http://www.env-health.org/IMG/pdf/heal_report_the_unpaid_health_bill_-_how_coal_power_plants_make_us_sick_finalpdf.pdf
[10] https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/386829/2_Coal.pdf

subcritical power stations. Delayed closure in these emerging countries, due to inaction in advanced economies, could be the thing that scuppers global climate change mitigation efforts - regardless of whether we have a new international climate agreement or not.

Given that the UK has not built a new coal-fired power station in over 40 years[11] and existing plants long ago paid off their construction costs, the price of accelerating an inevitable decommissioning process is likely to be very low. However, it is perfectly correct to say that accelerating coal closure, *without* a commensurate programme to build replacement capacity, interconnection, and improve energy efficiency, might endanger UK capacity margins.

And so the key is to have such a build programme in place early in the next parliament, including new gas-fired capacity in the short-term. While the removal of old coal capacity would have the consequence of improving the attractiveness of the UK market for other generation and demand reduction options - spurring investment - a scaled up programme of new investment may also be needed and this could be underpinned by the government's electricity market reforms, including new contracts-for-difference and the capacity market. Bringing forward investment in this way has clear environmental and social benefits, as well as the desirable consequence of generating investment at exactly the moment required to solidify and extend the UK economic recovery.

Closing subcritical coal would clearly need to be done in the most cost-effective way possible. Carbon taxes, emission performance standards, or tradable allowances are all mechanisms to internalise the externalities of coal combustion and could induce premature closure within the 2020 timeframe proposed here.

The EU Emissions Trading Scheme is unreformable in the near term and structurally oversupplied - it is therefore almost completely irrelevant for the timely closure of coal in the UK. The UK carbon tax regime lacks certainty and there is unlikely to be the political appetite to raise this tax to the levels required to permanently retire UK subcritical coal by 2020 - the impact on energy intensive industries and the windfall for existing low carbon generators make this an unattractive option. Perhaps the most effective strategy, therefore, is to simply regulate away subcritical through an appropriately tough emissions performance standard, introduced at the start of the next parliament, with a 4-5 year grace period.

Retiring coal plants quickly can help the world deal with the multiple scourges of coal – the deaths caused from air pollution and mining accidents, the local environmental impacts from both mining and combustion, and the staggering amounts of carbon pollution that makes the major contribution to anthropogenic climate change. The case for abandoning coal in a timely manner, starting with the oldest and least efficient power stations, is overwhelming. The UK has among the worst such power stations and has an opportunity to deliver significant environmental and economic outcomes domestically, as well as demonstrate global leadership, by phasing out subcritical by the end of 2020.

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[11] http://www.modernpowersystems.com/features/featurehow-will-the-uk-close-its-generation-gap-4303669/; http://about.bnef.com/press-releases/uk-capacity-market-will-benefit-old-coal-new-gas/; http://www.utilityweek.co.uk/news/tomorrow%E2%80%99s-generation/985402#.VNOBzi7Quiw

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