
29 Curbing carbon without curbing development

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The poorest countries have a strong interest in curbing global carbon emissions, because they have relatively more to lose from global warming. But they also have a strong interest in economic growth – only if they grow rapidly can they address the mass poverty which is their current experience. These two objectives potentially conflict. Global restrictions on carbon energy could impede the development of poor countries by denying them cheap energy, and also directly threaten the income of those poor countries which export carbon fuels. Hence, they need global arrangements which are effective, but which do not damage their economic interests. To date, the approach has been for richer countries to set themselves emissions targets while the poorest countries do nothing. This has neither been sufficiently effective in curbing emissions, nor has it provided the poorest countries with viable mechanisms for compensation. In this chapter I propose a different approach which targets the gradual closure of the global coal industry. Any effective approach to climate change will require drastic shrinkage of the coal industry. Focusing on the practicalities of closing coal, instead of the abstract concept of curbing carbon emissions, makes it easier to tap the potential moral pressure of ordinary citizens. Without this pressure, no conference agreement is likely to be implemented. Further, focusing on closing coal opens up straightforward ways by which the interests of poor countries might be protected.

Introduction: The dilemma for poor countries

To address climate change, carbon emissions will need to be curtailed. This is in the interest of poor countries because they are among the countries which are most vulnerable to climate change. This is partly because poor countries are mostly already

hotter than rich ones, partly because they will mostly lose a higher proportion of their GDP, and partly because of the structure of their economies, with a far higher proportion of their population dependent upon climate-sensitive agriculture. However, while addressing climate change is in their interest, poor countries are also potentially threatened by global measures to curb carbon emissions. This is because curtailing carbon emissions conflicts with the need of poor countries for large increases in energy consumption as an integral part of their development process, and with the need to clear forest for the expansion of cultivation. Further, many of poor countries are heavily dependent upon the export of carbon-based energy to finance their imports.

These tensions cannot be resolved by the pretence of a bifurcation between ‘rich’ countries that are ‘guilty’ of causing climate change and ‘developing countries’ which are merely the ‘victims’. This ethical bifurcation is untenable. First, there is no longer a bifurcation between ‘developed’ and ‘developing’ countries, but a continuum from the very poor, such as Malawi, to very rich such as Qatar, with China, now an above-middle-income giant, being the largest carbon emitter. Second, neither individuals nor entire societies are morally liable for the adverse consequences of carbon emissions prior to the recent time at which those adverse consequences became understood. Third, even for those recent emissions where some moral responsibility can reasonably be invoked, how should that liability be assigned between those countries which burn carbon-based energy, notably Europe, and those which extract it and sell it for others to burn, notably the Middle East, since both have evidently benefited? To date, negotiations have arbitrarily assigned all responsibility to the locations where energy is burnt rather than extracted, but this lacks moral rationale.

The interest of poor countries is therefore to encourage effective international action, from which they would benefit, while safeguarding their scope for rapid economic development. To be effective, proposed actions must be based on a global consensus on shared responsibility for curtailing future emissions. While the interests of the poorest countries such as Malawi will need to be protected, and high-income countries such as Saudi Arabia and Germany will need to make the earliest sacrifices, middle-income countries such as China and Poland will need to accept the duty to undertake costly actions.

Why current approaches have had limited success

To date, the international approach to climate change has largely been ineffective. It has been based on national emissions targets for OECD countries, implemented primarily through a mixture of regulatory measures, the promotion of energy efficiency, a pan-European cap-and-trade scheme and national carbon taxes. This has several weaknesses.

First, its implications for individual action by firms and households are highly unspecific. Carbon emissions could potentially be curbed by a myriad of behavioural changes which would generate largely unobserved, and mostly small, reductions in emissions. Unfortunately, this completely diffuses the responsibility for behavioural change and this feature in turn maximises the difficulty of achieving change. Indeed, the only practical mechanism for achieving such diffuse coordination is the price mechanism – carbon would need to be taxed, globally, to a common degree. However, this poses extreme political difficulties. Societies differ considerably in the degree to which citizens see their government as responsible for the price of carbon products. In many countries petrol is heavily subsidised; in Nigeria, for example, an attempt to remove this subsidy led to a violent national strike. As Sandel (2012) has argued, the market mechanism is contentious as a means of allocating morally charged resources. Concern over climate change has intentionally (and understandably) made carbon morally charged. The idea that the solution to a negative global externality is a global tax, while technically appealing to economists, is likely to be radically unacceptable to many people.

It is indeed notable that to date the civil society campaigns to arrest climate change, and the economic policy advice to achieve it, have been radically divergent. Civil society has emphasised personal moral responsibility – people should buy smaller cars, reduce their air travel, and suchlike – whereas economists have proposed the issuance of emissions rights which would be tradable on global markets. The tradable rights central to cap-and-trade can be efficient and generate mutual gains, but to many people they will appear to be morally repugnant – the ethical equivalent of medieval ‘indulgences’ in which a price is placed on the ‘right to sin’, with its implications that the rich will be able to continue sinning while the necessary behavioural change is undertaken by

poorer societies. Thus, the ethical weakness of the technical solution inadvertently undermines the overarching moral basis for global action.

Similar criticisms can be made of the Clean Development Mechanism, by which firms in developed countries buy emissions rights from firms in poorer countries which are paid to refrain from actions that they would otherwise have taken that would have increased their emissions. This opens considerable scope for scams and so only environments with reasonably trusted governance have met the criteria for verification. In practice this has meant that the main beneficiary from cap-and-trade has been China. Even before the ethics of such transactions are considered, it is apparent that an arrangement which required the US to make very large payments to China would not be acceptable to US citizens, so it is difficult to imagine this approach becoming global. Ultimately, 'international mechanisms' whereby continued emissions by some countries are offset by actions in others may prove to be ethically corrosive even if in principle they yield mutual benefits.

An alternative approach: Focus on coal

Carbon taxes, cap-and-trade, and emissions targets are all highly technocratic – they are very distant from the sort of practical actions that ordinary people can readily envisage. Yet carbon emissions are substantially reducible to one practical, concrete action: *closing the world's coal industry*. Coal is the king of carbon emissions. All technocratic mechanisms for curbing emissions implicitly involve the closure of the coal industry, but they have singularly failed to make this apparent, let alone addressing how, practically, it might happen. I now outline an alternative approach to curbing emissions which focuses on this practical issue of how gradually to close down the world's coal industry. Central to this approach is the protection of the developmental interests of poor countries (Harstad 2012, Collier and Venables 2014).

While emissions have been the overwhelming focus of policy attention, the corresponding issue of curbing the extraction of carbon-based energy from beneath the ground has received little practical attention. It may be much easier to control carbon emissions at the point of fuel extraction than at the point of consumption. While consumption is the result of a myriad of decisions by billions of people, extraction is

the result of a very limited number of decisions by a small group of firms. As a result, it is highly specific as regards moral agency – specific both in terms of the particular people whose decisions need to change and the particular actions that they need to take. This is important because the moral force of an action is not well-determined by its ultimate consequences. Pinker (2007) demonstrates how moral attribution can be teased out of the way we use ordinary language: ‘the concept of causation we apply when choosing our verbs is also the concept we apply when we hold people responsible. We single out the acts that a person *intentionally*, and *directly*, and *foreseeably* caused.’ (p. 228). If the power of moral agency is to be harnessed to curb carbon emissions, the generalised, diffused responsibility of everyone for every act that might directly or indirectly emit carbon, which is the approach taken by carbon pricing, is precisely wrong. Instead, public policy needs to focus on a very few salient emissions that can be directly connected to major decisions of a few key actors. On this approach, there is no doubt as to what the focus should be – it should be on closing the world’s coal industry. Ultimately, closing coal will not be enough, but as the single most important action, which is also likely to be the least costly, it is the right place to start. Practical success in closing coal would provide momentum for more complex actions which are correspondingly more demanding.

Coal accounts for around a quarter of all carbon emissions and around 40% of all known CO₂ in fossil fuel reserves. However, while it is the single most important source of carbon emissions, it is not an economically valuable source. Its energy output per unit of carbon emissions is lower than gas, and its cost of extraction and transformation into usable energy is higher than other fossil fuels. As a result, even before the fall in energy prices in late 2014, although coal constitutes 40% of the CO₂ in fossil fuel reserves, it constituted only 16% of the economic value of those reserves. As a result of the fall in global energy prices, the market value of coal mining companies has fallen by around 80%, which is a far larger drop than oil companies. This is an indication that the economic rents on coal extraction (the surplus of value over cost), which were already modest, are now very small. By closing coal ahead of other fossil fuels, there would be a larger impact on carbon emissions for a given loss of energy, and only a small loss of economic rents. Should CCS technology ever become viable, clean coal may redevelop, but to date it has proved to be far more difficult than envisaged (for example, Norway has recently abandoned its programme of research).

Further, by taking measures that directly curb the supply of coal instead of starting from curbing the demand for carbon energy, the problems posed by the ‘green paradox’ and international ‘leakage’ would be reduced. The green paradox arises as producers of carbon energy increase extraction in anticipation of the loss of future rents. Potentially this could happen with coal, since there are very large stocks in the ground. But the collapse in rents reduces such inter-temporal substitution of production – if there are no significant rents to protect, producers gain nothing by pre-empting anticipated controls. Additionally, the possibility of future CCS technology provides an incentive for leaving coal in the ground until it can be sold at a premium price as clean energy.

Leakage arises because those countries which act responsibly, curbing their carbon emissions, inadvertently create an incentive for other countries to do the opposite (see Fischer 2015). Action on both supply and demand faces this problem. If some countries (a ‘coalition of the willing’) act to reduce their demand for carbon energy, this reduces the world price of carbon energy and so increases consumption in other countries. Similarly, if some countries reduce their supply of coal, this increases the world price of coal and so increases coal production in other countries. However, the extent of leakage depends upon the price elasticity of response. The leakage from curbing carbon demand depends upon the elasticity of demand for carbon-based energy; this is high because there is a lot of scope for substitution from other fuels. In contrast, the leakage from curbing coal production depends upon the elasticity of coal supply, which is low. Hence, curbing coal production is likely to be the more efficient approach, less subject to being undermined by leakage, than curbing the demand for carbon energy.

Considerably more carbon-based energy has already been discovered than can safely be burnt, and so some of it must remain *permanently* unused. This creates the phenomenon of ‘stranded assets’. McGrade and Ekins (2015) estimate that to achieve the target of keeping the increase in temperature to only 2°C, a third of known oil reserves will be stranded and over 80% of known coal reserves. A key issue for poor countries is whether their own carbon assets will become ‘stranded’. For many poor countries, dependent upon carbon-energy for their exports, the threat of their currently valuable carbon energy assets becoming stranded is even more serious than the threat from climate change.

The new awareness that not all carbon-based energy can be used, and that coal is the least efficient source of carbon energy, is currently inducing the governments of high-income countries to inhibit the extraction of new coal deposits in low-income countries. For example, the Board of the World Bank is disinclined to approve loans for coal mining projects. There is a superficial rationality to saying that if we have already discovered more than we can burn there is little point in financing further discovery, a point made by McGlade and Ekins (2015). But the scope for new discoveries is far greater in poor countries. For example, according to World Bank data for the year 2000, the value of discovered sub-soil natural assets per square kilometre was five times greater in the OECD than in Africa. It is highly unlikely that this is because there was less to be discovered in Africa, it simply reflects Africa's much lower past investment in prospecting (itself a consequence of past poor governance). This was indeed confirmed during the carbon super-cycle of 2003-14, during which high prices induced a major increase in global search. Analysing the pattern of new discoveries and prospecting, Ross (2012) concludes that 'the vast majority of the world's new hydrocarbon supplies will come from developing countries in the next few decades' (p. 10). These new carbon discoveries in poor countries have the potential to provide transformative revenues, but many of them still require substantial investments in order to be extracted; examples being off-shore gas in Mozambique and Tanzania, and oil in Kenya and Uganda. Badly managed carbon regulation and NGO pressure for portfolio divestment programmes could have a chilling effect on many of these investments.

Freezing the discovery and new investment processes would therefore massively disadvantage poor countries. As a consequence, it would maximise the conflict of interest between poor countries and rich ones. Yet action on climate change requires a global consensus in order to generate moral pressure. What is needed is a morally reasonable basis for agreeing a path to reduce the production of coal. Two approaches have been proposed.

Harstad's (2012) approach is that a coalition of willing high-income countries should reduce global coal production by buying up commercial coal production and closing it. The approach of Collier and Venables (2014) is that coal production should be reduced through a sequence of closure according to the income level of the country. The Harstad proposal is technically the more efficient since the least valuable coal mines would be

closed first, wherever they might be located. However, it would be exposed to nationalist critiques brought by coal miners threatened with losing their jobs. For example, even an attempt by an Australian company to purchase a potash mine in Canada was vetoed politically because there was seen to be a risk that the mine would be closed by the foreign purchaser to increase market dominance. Further, by relying on an international market process it inadvertently undermines moral pressure. Allowing rich countries to reduce global carbon emissions by buying up and shutting down mines in poorer countries might be seen as weakening rather than implementing the moral case for collective action on climate change.

In contrast, the Collier-Venables proposal attempts to harness the moral energy generated by popular concern about climate change. It does so by using a fair basis for the sequence of coal closures to generate intense moral pressure on specific decision-takers at specific times. The sequence would require high-income coal producers to act first – specifically, Germany, the US and Australia. Until these three countries have begun closing their coal mines, no action would be required of others. However, once they have started to implement a closure plan, middle-income coal producers would be required not to expand their production. Once high-income producers have completed their closures, upper-middle-income countries such as Poland would be required to start their own closure programmes. Only once they start to close their mines would lower-middle-income countries such as Indonesia be required not to expand their production. At this point, a variant of the Harstad proposal could be added: oil producers in high-income countries could become subject to a ring-fenced cap-and-trade scheme. They would be permitted to buy rights to increase emissions from those coal mines in middle-income countries which were required to close. This would be morally attractive; for example, some of the oil rents of Norway and Saudi Arabia would be diverted to compensate Polish miners for their loss of jobs. The superiority of this over generalised transfer mechanisms is its specificity – clear and substantial losers are compensated, and clear and substantial beneficiaries of carbon rents are required to provide it. The process of closure would continue through lower-middle-income countries, eventually reaching low-income countries such as Mozambique.

Meeting rising energy demand in poor countries

The above approach could effectively defuse tensions between action on climate change and development in respect of the *production* of carbon-based energy. Low-income and lower-middle-income producers would be given considerable time before they were required to take action, with the precise duration depending upon how rapidly richer countries took action. However, it would not address the concerns of low-income *users* of carbon-based energy. Addressing climate change, especially through supply-side measures such as closing coal, will inevitably increase the global cost of energy. Poor countries will need large increases in their consumption of energy as they develop. To what extent is this higher cost of energy an impediment for them?

While it is in principle a legitimate concern, in practice it is minor. This is because in most poor countries the key energy-related impediment to growth is not the price of energy but its availability. Energy has been supplied through badly run public monopolies with the result that it has been highly unreliable. In consequence, firms have had to meet their electricity needs through individually owned diesel generators at very high unit cost. This is commonly listed in surveys of firms as their primary impediment. By increasing the availability of electricity governments of poor countries could substantially reduce its effective unit cost to their firms and households, even though the global unit cost of energy will be rising.

Poor countries have several means of meeting rising energy demand that are consistent with the above strategy for addressing climate change through closing coal. Several poor countries have their own coal supplies and so would be able to meet electricity demand through domestic coal for several decades. For the majority that do not have their own coal, both hydropower and solar power will become viable options for power generation. Africa and Central Asia have huge potential for hydro. For example, Ethiopia, with high rainfall on high ground and consequent kinetic energy from water run-off, is developing its vast potential in hydropower with prospects of very low unit costs of electricity. Solar energy has to date been more challenging because favourable endowments of sunlight have been offset by the high capital cost of solar panels. Rural Africa is littered with abandoned solar panels. However, as costs continue to fall this may be in the process of being overcome (Collier and Venables 2012). The combination

of coal, hydro and solar power becoming available to poor countries implies that they have scope to ramp up the supply of electricity. While it would technically be possible to develop a climate-related scheme by which international public money was devoted to financing this expansion, politically this has proved to be infeasible. The present proposal would achieve the equivalent of a financial transfer to poor countries through privileging them in respect of the sequence of closure of the global coal industry. This would not be politically easy, but it is arguably considerably less difficult than a direct transfer of finance.

Conclusion

Effectively addressing climate change is more in the interest of poor countries than of rich ones. Poor countries are more threatened by climate deterioration. However, past approaches to climate change – notably through emissions targets, cap-and-trade, the Clean Development Mechanism, and carbon taxes – have been relatively ineffective, while future, more effective approaches along the same lines have the potential to be detrimental to poor countries. I have suggested a switch from market-dependent solutions to greater emphasis upon moral pressure, by focusing on the sequential closure of coal. Because coal is the king of carbon emissions, any effective approach to curbing emissions will involve radical reductions in coal production. Yet over the past three years, despite technocratic attention on climate change, global coal consumption has actually increased. This reflects the severe disconnect between the technocratic solutions and what ordinary citizens recognise as morally actionable changes in behaviour. Without the moral energy of mass public opinion, technocratic solutions may be agreed in conferences, but they will not be implemented when subjected to the continuous pressures of political interests. It would be easier for people to grasp that coal has to be closed than that a mechanism such as cap-and-trade should be implemented. It would also be easier for people to recognise that the coal industries of rich countries should close before those of poor countries than for them to agree to large financial transfers from rich to poor.

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