ISN
ETH Zurich

12 June 2014

Towards a Geopolitics of Unburnable Carbon

What would be the geopolitical consequences of a worldwide tax that drove carbon-based sources out of the global energy mix? For Michael Bradshaw, it would mean that high-cost, unconventional and remotely located reserves would no longer be profitable to develop. Think of the Arctic, for example.

By Michael Bradshaw for ISN

Unburnable carbon

The 2013 report of the Intergovernmental Panel on Climate Change (IPCC) states that it is "extremely likely" that human influence has been the dominant cause of observed global warming since the mid-20th century. In their 2014 report, the IPCC concludes that without significant additional measures the baseline scenario will result in an increase in the global mean surface temperature of between 3.7oC and 4.8oC by 2100. Indeed, climate change means that the global energy security challenges of the future will be more complex than traditional concerns related to fossil fuel scarcity. But how exactly will climate change factor in to geopolitical calculations?

In the hope of limiting the increase in temperature to 2oC, the international community has agreed (in principle) to limit the atmospheric CO2 concentration to 450ppm by 2100. With this constraint in mind, it is possible to identify how much carbon dioxide can be emitted over the remainder of the century – in other words, a global carbon budget – if the target of 450ppm is to be met. Both the International Energy Agency (IEA) and the IPCC have argued that meeting the 450ppm target will require very significant reductions in the level of fossil fuel combustion— up to 80% by 2050. This means that current levels of proven fossil fuel reserves are already higher than can be burned without exceeding the global carbon budget – hence the notion of 'unburnable carbon.'

In their *World Energy Outlook 2012* the IEA concluded that "no more than one-third of proven fossil fuel reserves can be consumed prior to 2050 if the world is to achieve the 2oC goal, unless carbon capture and storage (CCS) is widely deployed." Moreover, according to the Carbon Tracker initiative, "governments and global markets are currently treating as assets reserves equivalent to nearly 5 times the carbon budget for the next 40 years." The financial consequences of using only 20% of these reserves have yet to be properly assessed. The geopolitical consequences, however, could be even more serious, particularly for countries – like Russia – with ambitious plans to develop fossil fuels in places like the Arctic.

A 'carbon bubble' and divestment

The notion of a 'carbon bubble' is gaining attention in financial circles as well as in think tanks and

academia. Real or not, there is a growing perception that 'demand destruction' arising from climate change policy could damage the financial future of carbon-intensive sectors. This perception has given rise to the fossil fuel divestment campaign. According to a recent study by the Smith School at the University of Oxford, the aims of the campaign, which targets institutional investors such as pension funds and University endowments, are threefold: to 'force the hand' of fossil fuel companies to leave fossil fuels 'down there;' to pressure fossil fuel companies to reduce their carbon emissions by switching to less carbon-intensive forms of energy supply; and, finally, to pressure governments to enact legislation to slow fossil fuel development and to introduce a carbon tax.

The response of the IOCs

In recent months, the major fossil fuel companies have been challenged by shareholder groups to consider the consequences of climate change policies for their business prospects. Both ExxonMobil and Shell have given presentations to shareholders and prepared long-term demand forecasts for fossil fuels. Reading these forecasts (such as ExxonMobil's *Energy Outlook* and Shell's widely-respected *Energy Scenarios*) together with the companies' responses to shareholders suggests that, while they acknowledge the significance of climate change, they do not anticipate significant constraints on demand for fossil fuels between now and 2050. The forecasts marshal projections by the IEA and the US Energy Information Administration that show sustained demand for fossil fuels. They also maintain that the unburnable carbon thesis ignores the role of CCS, natural gas, bioenergy and efficiency improvements. The problem with these forecasts is that the scenarios on which they are based *all* entail GHG emissions trajectories that will result in global warming in excess of 2oC.

In short, fossil fuel companies are confident that they will continue to succeed because the world will continue to fail to agree to constrain emissions. They see no credible scenario involving a significant decrease in the demand for fossil fuels in the coming decades, and therefore no need to change their investment plans or deviate from 'business as usual'.

The rising cost of fossil fuels

There seems to be no way to reconcile the narrative of the IPCC, IEA and environmental groups on the one hand, who predict a significant reduction in the demand for fossil fuels and the emergence of a carbon asset bubble; and those of the IOCs, on the other hand, who see continuing high levels of demand for fossil fuels and thus the need to invest in new reserves—conventional and unconventional—and their associated infrastructure.

But what would the world look like if there *were* a global carbon tax that forced hydrocarbons out of the global energy mix? In current energy and climate models that factor in the 2oC constraint, unabated fossil fuels (that is, without carbon capture and storage) simply become too expensive to use (due to the high tax on their associated carbon emissions) and are replaced by low-carbon alternatives. In such a world, sources of fossils fuels would only be developed if the cost of recovery were low enough to compensate for the carbon tax—meaning that high-cost, unconventional and remotely located reserves would no longer be profitable to develop. Because geography matters immensely in the cost of extracting and transporting fossil fuels (particularly in the case of liquefied natural gas), this would have significant geopolitical implications.

Of course, geopolitics also provides a caveat to this scenario. Indeed, there are many examples of higher-cost reserves being developed in the name of energy security. The OECD's response to the formation of OPEC in the 1970s, for example, was to develop higher-cost domestic oil and gas production in Alaska, the Gulf of Mexico and the North Sea. There are also many cases where lower-grade domestic and more proximate coal resources have been developed, rather than importing cleaner fuels.

Nevertheless, a recent study by the Institute for Sustainable Resources at UCL provides an indication of the geopolitical consequences of unburnable oil. Combining a global energy systems model with an oilfield production model, the study identifies existing oil reserves that cannot be exploited before 2035 if there is to be a 50% chance of meeting the 2oC target. If CCS is not available, 45% of existing reserves must remain in the ground. Overall, the development of four categories and types of oil is likely to be constrained: arctic oil, light tight oil, deepwater resources and unconventional sources—oil shale and oil sands. In the authors' words, 'a large disconnect appears to exist between policies permitting exploration in new areas, particularly in Arctic and deepwater areas, and pledges to restrict temperature rise to 2oC.'

The geopolitics of fossil fuel demand

The geopolitics of fossil-fuel energy security is currently framed in terms of rising prices and an inability to match supply with demand. In these scenarios, ever more remote and expensive reserves must be developed to meet growing demand. This is the world beyond 'peak oil' that empowers those countries and companies with control over fossil fuel reserves. By contrast, those that are import-dependent are exposed to energy insecurity and vulnerable to energy geopolitics.

An alternative world is one where there is a global agreement on climate change and where effective carbon taxes drive the destruction of demand for fossil fuels. In these scenarios, the more expensive reserves remain in the ground and revenues from fossil fuel production fall substantially. However, the reality is that the geopolitics of demand destruction is as troubling as that of fossil fuel scarcity. The difference is simply that, in the alternative world, the traditional exporters of fossil fuels are the ones that suffer economically and politically.

Whose assets will be stranded?

Public discussion about the geopolitical consequences of unburnable carbon is badly needed. After all, it matters enormously whose assets will be stranded. This can be illustrated with a simple example. If high-cost reserves cease to be economical, Arctic offshore oil and gas projects – which are very costly, technologically challenging and require substantial long-term investment – are the most likely to be affected. For a country like Russia, whose energy strategy is predicated on the development of Arctic offshore oil and gas production and whose economy is heavily reliant on tax revenues from fossil fuels, the implications are serious indeed. Furthermore, the future development of Russia's continental shelf is tied to a series of joint ventures with international oil companies. Those companies have remained in Russia despite pressure from the G7 after recent events in Ukraine because they believe that they cannot afford *not* to be, as Russia represents access to future reserves. But what if those reserves turn out to be unburnable and unprofitable? Indeed, although these Arctic projects are still at the early exploration phase, they may already be at risk of becoming frozen assets.

Geopolitics of mitigation

Limiting global warming to 2oC will require a substantial departure from business as usual. In particular, the consequences of a significant decline in demand for fossil fuels over the coming decades need to be understood. Unburnable carbon will produce winners and losers. It could also transform the geopolitical landscape, resulting in new security challenges and patterns of conflict.

Michael Bradshaw is Professor of Global Energy at the Warwick Business School and author of Global Energy Dilemmas: Energy Security, Globalization and Climate Change, published by Polity Press.

Publisher

International Relations and Security Network (ISN)

http://www.isn.ethz.ch/Digital-Library/Articles/Detail/?id=180596&lng=en

ISN, Center for Security Studies (CSS), ETH Zurich, Switzerland