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Fueling Geopolitics

By Walt Patterson

According to the Oxford English Dictionary, geopolitics is 'politics (esp. relations between states) as influenced by geographical factors; the branch of knowledge that deals with this'. What might such geographical factors include? The first and most obvious is of course borders, the geographical locales that define the boundaries of individual states, the places at which different states meet and interact. Then come the attributes found within state borders, that affect the interests of states outside those borders. High on the list of these attributes are resources, such as food, water, minerals and fuels - valuable materials whose possession, production and use are beneficial or indeed essential to the economies of the states that have them, and that may be desired or indeed coveted by other states. To gain access to the resources within the borders of a particular state, other states may resort to trade, negotiation or, ultimately, war.

Examples abound. Rivers crossing borders are raising tensions about water-access along the Mekong, Euphrates, Nile and elsewhere. Crop failures leading to export bans are raising prices and stirring hostility between grain exporters and importers. China's abrupt crackdown on the export of rare earth metals, essential for modern electronics and other innovative applications, has alarmed OECD countries long dependent on Chinese suppliers. But the resources most acutely vulnerable to geopolitics, because of their comprehensive global importance, are fuels - oil, coal, natural gas and uranium.

Fuel as a significant factor in geopolitics dates back about a century, to the decision by Winston Churchill to switch from domestic coal to imported oil for the steamships of the Royal Navy. Fuel supply became a critical geopolitical issue during World War II, and has remained so ever since. For most of the past century the most geopoliticized fuel has been petroleum. Key players have included the original Seven Sisters, the major multinational oil companies of the 1950s to 1970s, and their successor companies, arrayed against their recalcitrant partners-cum-adversaries in the Organization of Petroleum Exporting Countries (OPEC). The national oil companies of the exporters have since joined the fray, and the jockeying for position and influence continues. In 2012 the threat by Iran to blockade the Strait of Hormuz, the narrow lifeline linking most Middle Eastern oilfields to their thirsty customers around the world, is just the latest in a long series of geopolitical confrontations over oil.

Since the 1970s, however, oil has been joined by natural gas as a source of geopolitical tension. Controversies have included disputes over offshore boundaries and offshore drilling in the North Sea, the North Atlantic, the Barents Sea and the China Sea; confrontations over international pipelines including Nordstream, Sudstream and Nabucco in Europe and Keystone XL in North

America; diversion of gas from transit lines through Ukraine leading Gazprom to cut off supply to western Europe; and most recently the rise of enthusiasm for shale gas in some countries such as Poland, whereas France has banned shale gas fracking.

Even coal now figures in geopolitics, not so much as an international commodity but as a global pollutant. The international trade in coal has arisen even more recently than that in natural gas, dating back in significant quantities only to the 1980s. But even as the global coal trade has expanded, so has environmental and accordingly geopolitical objection to its use. The Intergovernmental Panel on Climate Change, the most authoritative scientific body assessing climate risks, has identified coal as the most serious source of fossil carbon dioxide emissions to the atmosphere; and some governments have responded accordingly. But global coal use, especially to generate eiectricity, continues to rise rapidly; and major multinational companies are eagerly developing massive new coal reserves in Mozambique and elsewhere. As the Kyoto Protocol reaches the end of its first phase, the mounting evidence of alarming climate change, from the Antarctic to the high Himalayas, clashes head-on with rhe geopolitics of fossil fuel production, sale and use.

Nuclear enthusiasts have seized on climate as a reason to relaunch nuclear power technology, after a long hiatus engendered by rocketing costs and erratic performance. But nuclear fuel and nuclear technology have been racked by geopolitics essentially since the discovery of nuclear fission in 1938. Uranium has always been a strategic material and still is, as more and more countries contemplate acquiring the capability to arm themselves with nuclear weapons. The link between nuclear power and nuclear weapons, aggravating international concern, has long cast a shadow over many ostensibly civil nuclear programmes, most recently that of Iran.

Human energy systems thus raise many geopolitical issues. Even electricity can bring tension crossing borders - between Canada and the US, between Germany and France, by direct-current links around the Baltic, and indeed by the Desertec proposal to generate solar electricity in North Africa to supply Europe. Rare earths, now being hoarded by China, are key materials for much innovative electricity technology, and lithium is suddenly a crucial element in batteries everywhere. Nevertheless, of all the various aspects of energy systems caught up in geopolitics, fuel is much the most wide-ranging and deep-rooted, the most potentially explosive. Yet, paradoxically, it might also be the easiest to defuse.

The international dimension of fuel, the export-import interdependence of its users and producers, is a relatively recent development. For oil it is less than a century - in significant amounts not much more than half a century; for uranium - as a fuel rather than for weapons - less than half a century; for natural gas less than four decades; for coal less than three decades. The demand for fuel depended on, and grew in step with, the expansion of the user-technology requiring it. For many applications, those for instance using coal in fireplaces and boilers, in many countries the fuel could long be supplied from domestic sources. Internal combustion applications such as motor vehicles, however, required petroleum products, in particular gasoline and diesel, available from the outset only from comparatively few locations, notably the southern US and several countries in the Middle East. Motor transport was therefore susceptible to geopolitics essentially from its inception.

Petroleum producers and refiners also sought markets for other fractions, and offered prices that attracted many buyers, often in other countries. The advent of electric light made kerosene less important in the refinery split; but heating oil, for instance, found a ready market. Over time, the spread of user-technology relying on various fractions from petroleum refining, and especially the spread of motor vehicles, made the market for petroleum-derived fuels more or less global, despite

the limited number of producer-countries. Oil became, and remains, the most geopolitical fuel, in part because for transport applications no ready alternative exists.

The case of natural gas is rather different. For most of the previous century natural gas was not a desirable fuel but an unwelcome hazard to those drilling for oil, to be got rid of, usually by burning it in a flare. The same still applies in Nigeria and in much of the Middle East, because of the difficulty and expense of transporting a gaseous fuel to potential users. By the late 1960s, however, the attraction of a fuel that burned cleanly with no solid waste, sulphur or particulates spurred a rapidly-growing enthusiasm for natural gas, initially as a way to use domestic sources - in the Netherlands with the Groningen field, in the UK with North Sea gas and also in the US. But other opportunities burgeoned, including exports and imports. Enthusiasm for natural gas grew so fast that in 1978 the US even passed a Fuel Use Act banning the use of natural gas for electricity generation, to conserve the available resources for premium applications. That did not last long. More and more gas poured into Europe, especially from the then Soviet Union to the east, even as the Reagan administration in the US labelled the Soviet Union the 'evil empire' - a classic case of economics overriding geopolitics.

A striking corollary of the rise of natural gas was its effect on user-technology. In the UK, for instance, the government decided in the late 1960s to convert the entire UK gas-supply system from coal-based 'town gas' to natural gas from the North Sea. The conversion programme entailed sending technicians door to door, to every premises on the system throughout the entire country, to replace every burner on every appliance. If you did not let the technicians carry out the conversion you were disconnected from the supply. The conversion programme, lasting a decade, was intenseiy controversial. In retrospect, however, it was perhaps the single most sensible energy policy decision in the UK for half a century.

It also underlined emphatically the intimate interdependence, too often overlooked, between any particular fuel and the user-technology that burns it - of particular importance in the geopolitics of fuel. To most people, the geopolitics of energy now means above all what politicians call 'energy security'. But the more accurate expression is 'fuel security'. Fuel security is now an issue for politicians and geopolitics precisely because so many countries now have a vast inventory of user-technology - buildings and their contents, industrial plant, vehicies - that require reliable and affordable supplies of particular fuels if they are to deliver the services we desire. For reasons of advantageous prices and attractive contracts, and often for lack of domestic supplies, much of this fuel in many countries is now imported.

That makes imported countries vulnerable, sometimes distressingly so, to international power plays by fuel suppliers, such as the quadrupling of the world oil price by OPEC in 1973, or more recently Gazprom's challenge to Ukraine, and by extension to much of Europe, to take but two examples of many in recent decades. The key conclusion to draw from episodes such as these is that the most frequent and pressing geopolitical problems affecting our human energy systems are not about 'energy'. They are quite specifically about fuel. The obvious rational deduction is therefore to endeavour to reduce the vulnerability, by reducing dependence on fuel.

Such a proposition will strike many as unrealistic, even foolish. It is not. The starting point is to recognize the importance of competition in energy policy. The competition of most crucial relevance is not the conventional competition, between different suppliers of the same fuel. The competition that will make a real impact on fuel use, and thus on geopolitics, is the competition between fuel and user-technology. The better the user-technology, the less fuel it needs to deliver the desired service. Throughout the latter half of the last century, the cheapness and ready

availability of fuel, including imported fuel, led architects, designers and manufacturers to make buildings, appliances, vehicles and other user-technology so ill-conceived that they could hardly deliver the desired services at all without substantial inputs of fuel or electricity. The mediocre performance of the vast array of existing user-technology created under the influence of cheap and readily available fuel is now catching up with us. Upgrading this performance ought to be the top priority for real energy policy everywhere, not least for geopolitical reasons.

Politicians and commentators have for decades acclaimed the allegedly critical role of what they call 'energy efficiency', without ever really taking the concept seriously as a focus of policy. In any case 'energy efficiency' only measures how well technology uses fuel; it says nothing about how well the technology delivers the services we actually desire. After the requisite dutiful nod to efficiency, policymakers almost invariably turn their attention yet again to supplying more fuel, much of it imported, often from potentially troublesome sources, which we will then continue to waste in our inadequate buildings and other user-technology.

Why do we not take seriously the opportunity to upgrade mediocre user-technology? The problem may arise in part precisely because so-called 'energy efficiency' has long been identified as easily the most economic way forward for human energy systems. Policymakers tend to assume that since 'efficiency' will pay for itself, it needs no policy support nor financing. That misses a critically important point. Upgrading inadequate buildings, for instance, will indeed bring a substantial return on investment, by dramatically decreasing running costs; but the investment has to happen first. Doing a thorough retrofit on an inadequate large building may mean an initial outlay running into seven figures; the now-famous refurbishment of the Empire State Building is a vivid example. Financing such an undertaking requires capital up front, in much the same way as building a new power station. Until policy recognizes that upgrading user-technology means investment, possibly major investment, a vast opportunity - not least a geopolitical opportunity - will go unrealized.

Why a geopolitical opportunity? The reason should be clear. Upgrading user-technology such as buildings has to happen where the buildings are - that is, within a state's borders. The necessary materials and labour can also come mostly from domestic sources. Imported materials, if any, will be far less subject to geopolitics than fuels. A government that launches - and publicizes, with regular progress reports and analysis, including financial analysis - a major programme of upgrades, particularly to its own buildings and other infrastructure, is sending a message, not only to its domestic prlvate industry, general public and voters but also to its foreign suppliers of fuel. To its domestic constituency, the message is straightforward: we the government are no longer telling the rest of you what to do - we are showing you. To the foreign suppliers the message can be put diplomatically: we value your supplies so much that we are going to stop wasting them. But the underlying message is likewise simple: if you think you can raise your prices indefinitely, or threaten to interrupt supplies for geopolitical reasons, think again. We are reducing our vulnerability to fuel-based blackmail.

As well as upgrading existing user-technology, another avenue is also open to reduce the role of fuel in geopolitics. Human society uses two forms of electricity. One we generate using fuel. The other we generate by setting up physical infrastructure that harvests natural energy flows and turns them into usable electricity. The oldest and best-known form is hydroelectricity. More recently we have added wind power, solar thermal power, solar photovoltaics, and various forms of marine power. This electricity does not use fuel. It has long been known as 'renewable'. A better term is 'infrastructure electricity'. You invest in a physical asset - a wind farm, say, or a solar array. Once in place and functioning, a piece of infrastructure, it delivers electricity with no fuel cost nor fuel risk, and mostly with minimal running cost of any kind. Moreover, most of the natural energy flows of

potential interest, as abundant opportunities for infrastructure electricity - even, for instance, offshore wind - arise within the borders, the political boundaries, of a state, to be made available to user-technology within that state. Infrastructure electricity, like upgrading user-technology, can minimize the impact of geopolitics.

For infrastructure electricity, the main geopolitical dimension arises not from international commodity trade but from international technology contracts. The major manufacturers of wind and solar technology, for instance, are still few in number, and those outside China are rapidly being overtaken by their Chinese competitors. However, once an infrastructure electricity installation is in place and functioning, it becomes part of the state's domestic energy system, within the state's borders and outside the realm of geopolitics.

Upgrading user-technology and installing infrastructure electricity are business activities quite different from today's so-called 'energy market', which is a commodity market based mainly on short-term trading in batch transactions, in which the unit price is the dominant concern. Upgrading user-technology and installing infrastructure electricity both entail initial investment that may be substantial, after which future costs and risks are likely to be minimal. Business models to foster this approach are as yet embryonic, but they are emerging.

The major hurdle to be overcome, however, is all too obvious. Today's global fuel business is vast. Its participants include not just some of the world's largest and most powerful companies, but entire countries - Canada among them. Their revenue streams depend on selling as much fuel as possible. Any suggestion that the world might find a way to use less fuel will not be greeted with enthusiasm. On the contrary - it will be challenged, directly and indirectly, by those who see the suggestion as threatening their interests. But the advantages of reducing dependence on fuel, minimizing waste and ramping up infrastructure electricity, are already clear; and the advocates of this radical change worldwide are growing steadily stronger. Transforming energy systems will also transform the geopolitics of energy.