

The Geopolitics of Renewable Energy

Opening comments by Walt Patterson

A resource is something we want to use and know how to use. The value and commercial status of a resource changes over time. The value depends on what a potential user wants to do, and the other resource options with which to do it. What was once a resource may no longer be. Six decades ago asbestos was a resource. Now its hazards far outweigh its usefulness. Many people now see coal in the same way. As the evidence of dramatic and devastating climate change gets ever harder to ignore, oil and natural gas might well be next. Yet even as these traditional resources face increasing challenge, innovative resource options are rapidly emerging. The implications for the world economy and geopolitics are profound and far-reaching.

A key use of resources all over the world is to generate electricity. Traditional resources include coal, natural gas, petroleum and uranium. All figure prominently on the new Chatham House website <resourcetrade.earth>. Competing with these, however, are other resources that cannot be traded internationally, notably wind and sunlight.

Both, of course, are specific to given locations. Unlike commodity fuels, metals and other materials, which can be extracted in one place and transported for use somewhere else, including internationally, wind and sunlight are immaterial. They have to be used where they are. Both wind power and solar power are nevertheless becoming steadily more significant contributors to electricity generation.

For material resources, key data are the location and quantity of the resource that can be accessed. The same applies to the non-material resources of wind and sunlight. As is the case for material resources, the immaterial resources of wind and sunlight also raise questions of ownership, and of permission to utilize them. No one owns the wind or the sunlight; but someone often owns the place where the wind blows strongest or the sun shines brightest. To use the wind or the sunlight requires access to the place. Until recently, such access, by purchase or rental of land or roofs or other suitable locations, took place almost entirely within national borders. Of late, however, contracts for wind or solar electricity generation have begun to involve numerous international transactions.

Wind power and solar power can both be called 'infrastructure generation': substantial initial input of materials and investment, after which the resulting physical infrastructure produces electricity, perhaps for decades, with minimal further cost. Relying on wind and sunlight thus confers a form of energy independence - unless, of course, the wind or solar generators are owned and operated by foreign entities. Acquiring materials for infrastructure generation now often entails international trade, for instance for copper, cobalt, cadmium, tellurium, and rare earths. The requisite investment may also be by foreign companies.

Like material resources, wind and solar resources are widely but unevenly distributed around the world. One striking feature of solar resources in particular is their availability in low-latitude areas, which include not only very wealthy countries such as Saudi Arabia but also very poor ones, notably in sub-Saharan Africa. In rural areas, decentralized local generation, especially solar, may be the most practical and feasible option to make electricity services available to the billions still without them. Recognition of and development of solar resources in poor countries, almost certainly

requiring international support and involvement, could be a major contributor to raising the standard of living in these countries.

World electricity is undergoing a hectic transition, from traditional centralized generation mainly based on fuel and fire, to much more decentralized generation, more and more based on fire-free renewable resources such as wind and sunlight. The speed of this transition will depend first of all on the political infighting now raging, in the US, China, India, Europe and elsewhere, between the traditionalists and the innovators. It will also reflect the dramatically changing economics of the alternatives, as well as increasing concern about environmental impacts, especially local air pollution and global overheating. How the electricity transition evolves will have a marked impact on geopolitics worldwide.

Q&A

What are the mechanisms through which renewables could shape geopolitics?

Both our local and our global problems, urban air you can't breathe and atmospheric overheating of the entire planet, are ultimately caused by our use of fire. The key renewables, wind and sunlight, neither of which use fire, reduce the political and economic power of the fuel suppliers - I call them the fire-feeders - both state and corporate. Wind and sunlight reduce reliance on fire and thereby reduce requirements for fuel. They redistribute political power, both to new centralized players such as the internet giants, and also to more decentralized players, potentially down to neighbourhood and village level, by offering opportunities for participation, investment and control.

Are countries already positioning themselves geopolitically so as to safeguard their energy security?

Some are. Because renewables such as wind and sunlight are location-specific, and therefore domestic resources within a national border, increasing reliance on them reduces exposure to international fuel prices and policy pressures, thus enhancing energy security. At the same time more local energy systems foster whole-system thinking; when you generate your own electricity you are less likely to waste it, and more likely to upgrade user-technology such as buildings - again reducing vulnerability to interruptions of the energy services we actually want.

Is there a potential that energy will be much more decentralized?

Both energy use and energy provision, particularly in the form of electricity, are already becoming more decentralized in at least some places. The trend will spread and accelerate.

If so, what impact would this have upon geopolitical relations around the globe?

It will increase some tensions, as previously powerful players - the fire-feeders - find their markets shrinking, prices falling and influence dwindling - a trend they are already bitterly opposing. But it will also reduce some tensions, as some players reduce their vulnerability and enhance their security. Over time it will dramatically redraw the map of geopolitical power.

Which countries already have the natural resources needed to start the transition to a more widespread use of renewable energy?

The transition does not need to be started; it is already well under way, in countries as diverse as Germany, Denmark, Australia, parts of the US, China, and India, and islands in the Caribbean and the Pacific. Wind resources are vast and widespread, even at high latitudes. Solar resources are more concentrated at lower latitudes, but are significant, albeit with some seasonal limitations, even in Scandinavia. Moreover the countries most in need of additional energy resources are themselves mostly at lower latitudes - a good fit for solar development.

As almost all mining, production and processing of rare earth elements takes place in China, what impact will that have on China's position in the renewables market?

Rare earths caused a 'bubble' around 2010-11, but their importance has since receded, as my old friend Amory Lovins described in great detail in the *Bulletin of the Atomic Scientists* in May this year. Other options now make the various rare earths at most a possibly useful alternative, not a requirement. China has been outflanked.

And what internal geopolitical consequences could renewable energy generate?

'Internal' presumably means within a national border. As for international geopolitics, renewable energy, particularly fire-free sunlight and wind, reduces the economic and political leverage of the fuel suppliers - the fire-feeders - their investors and supporters. That might have a dramatic effect on a country such as the US, where fuel suppliers exercise profound influence on politics, with the US now the only country worldwide unwilling to support the Paris agreement. In China a battle is already raging between traditional coal-fired generators and renewable generators, for access to overcrowded transmission systems. In countries such as India and parts of Africa and Latin America, local decentralized renewable electricity could further weaken the hold of the inefficient and often corrupt state electricity bureaucracies. That of course is why these bureaucracies often offer stubborn opposition to decentralized renewables. As always, the fight for the future may be disguised as economics but is fundamentally political.