

The Potential Impacts on the Geostrategic Environment of the Transition to a Low-Carbon Economy

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The world must begin now to transition towards a low-carbon economy—the health of the planet requires it and increasingly societies and its people are demanding it. This transition will fundamentally alter the nature of the energy sector—how energy is provided and where it is produced. As a result, there will necessarily be fundamental changes to the geostrategic environment and the security dynamics globally, both during the time of transition and after the transition is complete. Exactly what those dynamics are and what the changes will be are unclear, but we do have some clues as to what we can expect and what we should look for as we move towards a lower-carbon future.

Energy and geopolitics have been intertwined for over a century and will remain so. Control of natural resources and over trade and transit routes was central to European imperial expansion and war. After 1945, oil was an important part of the decolonization story, specifically in the assertion of sovereign rights over states' oil patrimony and the formation of the Organization of Petroleum Exporting Countries (OPEC) to counterbalance the power of U.S. and European oil companies. Producer states have used their power as derived from their natural resources to protect themselves and gain political advantage. The criticality of hydrocarbons for the world has been a driver behind U.S. force deployments and security guarantees in the Middle East and for maritime trade

routes for decades.

While the transition to a lower-carbon economy will be as varied and complicated as there are nations in the world, the fundamental pieces of any effort to decarbonize energy provision is based on 1) electrifying as much as is possible as quickly as possible; 2) ensuring that the power that supports that electrification is from sources that do not emit carbon, or at least emit far less carbon; while 3) working to develop new technologies that will either modify how difficult-to-electrify elements of the sector are powered or capture carbon before it is released or after it is in the atmosphere.

The effects of the transition to provision of energy through lower-carbon means will not affect the nations of the world evenly. As more developed economies come to rely less on hydrocarbons, we should expect to see the demand for hydrocarbons shift to emerging economies. As a result, hydrocarbon producing states will not initially see a significant reduction in demand but will see a change in markets. And within time, even the markets in developing nations will become more diversified and electricity based. Many analysts predict that oil demand will fall amid increasing electrification, while the growth in gas demand remains relatively widespread across sectors and regions, albeit only over the next two decades. The dual trend of electrification and decarbonization pressure means that the energy trade will

likely become more localized and consumer oriented. When aggregated, these trends represent a radical transformation (see bp Economic Outlook assumptions).

There are three principal impacts we would expect to see as a feature of a transition to a lower-carbon economy:

1. an overall decline in oil demand;
2. a changing gas market structure; and,
3. growth of renewable and nuclear energy.

While the implications of these impacts are difficult to predict, there are many parts of this puzzle worth examining as the transition continues.

1. Decline in Oil Demand

As demand for oil decreases, it is likely that the lowest cost producers in the Middle East and Russia will remain in business and that the OPEC share of global demand will hold up well due to the lower cost to produce each barrel of oil and the lower carbon content of conventional reserves. Meanwhile, oil demand growth is likely to be focused in emerging and developing markets, mainly in Asia. As Western states assign lower priority to Middle Eastern supplies in comparative terms, the importance of the Middle East to rising demand centres will correspondingly increase.

However, stability of middle-eastern supplies will still be important enough to U.S. allies in Asia and global stability, and the region will still retain other security interests so that the United States will likely need to maintain some level of security guarantees to key states in the region and the trade routes towards Asia.

Both China and Russia are likely to continue to be involved in the region and the conflicts within the region will not abate during this time as these conflicts are only marginally concerned with natural resources.

What may be more concerning for geostrategic stability is the implications of a decline in oil demand on states traditionally reliant on income from oil rents. There is some research that suggest that “petro-states” are more inclined to participate or support violent, inter-state conflicts. Examples are not hard to find: Saddam Hussein (Iraq) and Colonel Gaddafi (Libya) each initiated several regional conflicts and sponsored insurgent groups for decades. More recently, Saudi Arabia, Iran, Qatar and the United Arab Emirates (UAE) have all intervened in civil wars in Yemen, Lebanon, Libya, Syria and Somalia. It is unclear if declining rents will spur more violence or less—the answer likely depends on the internal stability of each individual nation and how much the nations formerly dependent on oil extraction have been able to restructure their economies and address fundamental problems in their societies. The more nervous the regime, the more unpredictable its behaviour as the fundamental support for its economy starts to decrease in importance. The short answer is that we do not know how the decline of oil will impact internal stability in petro-states, but we do know that this is an area to closely monitor.

2. Changing Gas Market Structure

Ownership of natural gas has rarely been a source of geopolitical rivalry in itself but control over supply and transit routes has sometimes thrown up geopolitical

conflict. Most cross-border natural gas pipelines operate without a problem (e.g., Morocco and Algeria have very difficult bilateral relations but the Maghreb-Europe gas pipeline (Algeria-Spain via Morocco) has never been used as a source of leverage by either side). Notable recent tension between Russia, Ukraine and other Eastern European states over gas transit issues is far more a product of Russia's long-standing fears of declining influence in its Near Abroad and just one convenient tool Russia can use to exert influence. However, even as Europe will still need Russian gas for the next two decades at least, the increased integration of the European gas market, the diversity of supply routes, and greater access to LNG has the capacity to soften geopolitical tensions and reduce stress points for Russian gas deliveries to Europe.

Unfortunately, denied the ability to use the provision of natural gas as a tool to influence Europe, Russia could turn to other tools to ensure its continued influence in its Near Abroad ranging from influence operations, traditional military coercion to cyber attacks. As the electricity grid grows more complex and touches more part of the economy during the adoption of a lower carbon sector, the possibility for catastrophic disruption from a deniable cyber attack increases.

3. Growth of Renewable Energy

The geographical, technical and market characteristics of renewable energy are different from those of oil and gas. Most states can produce at least some of their own renewable energy to generate electricity. Production and trading of renewable energy can and does occurs at

local, national and regional levels. This is a significant shift from oil and gas regulation which is generally done at the national level and could lead to new types of conflicts between local communities and higher-level governance over issues such as land use, ownership structures and pricing.

While the ability to generate power locally rather than having to obtain resources from elsewhere will likely have some beneficial effects for the consuming nations and regions, in other respects it will just create new dependencies based on the inputs required to exploit renewable energy, for example: hardware (e.g., solar panels, batteries, turbine components); essential components in renewable product, notably rare-earth minerals; and intellectual property in the form of patents and service capabilities. The concern over the concentration of rare-earth minerals has already been seen when China limited exports of tungsten and molybdenum, vital for electronics parts, to Japan in 2010. The world could see a growing dependency on nations rich in these resources like the dependency on hydrocarbon-producing nations. Also, Chinese manufacturers currently produce over 80% of solar panels sold globally and five of the top ten wind turbine manufacturers are Chinese. While this in some respects mirrors China's dominance in other manufacturing, it is an area to watch carefully if rapid access to renewable technology is required and is an issue that could be directly affected by other related or even unrelated trade disputes.

In many ways, this is the impact of the transition that is hardest to predict. Localization of energy production is a fundamentally different construction of

the energy sector. As the renewable market matures, the level of intervention by geopolitical actors will probably increase. But the geopolitics of renewable/nuclear energy and electricity production and transmission are very different from the geopolitics of oil and gas, and as a result the implication for geopolitics is hardest to judge.

Conclusion

We should expect the diversification and decentralisation of energy production to empower consumers. Importing states may be the winners of the energy transition and less developed economies could benefit disproportionately as they can develop with less dependence a global marketplace for hydrocarbons. But countries will still need to secure access to energy at the right time and price. Transport and storage capacity will be important. Efficient producers, large consumers and rule setters will gain leverage. And the full effects are not likely to be known for many decades. None of this is to argue against the transition to a future that will produce lower carbon emissions—as stated, this is a global imperative. But it is to say that we must watch carefully as this new sector emerges, not only for the positives that may come of it, but of the new problems it might create.

This paper was presented by Bob Scher at a workshop at Perry World House, the University of Pennsylvania's global affairs hub, and was co-authored by Bob Scher, Michael Denison, and Michael Cohen.