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# An Energy Transition Amidst Great Power Rivalry

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## Summary

The transition towards renewable energy is expected to have a fundamental impact on great power relations. Yet great power rivalry also shapes the speed and direction of the energy transition. The outcome of this complex interplay will depend greatly on how countries strategize regarding the energy transition. They can embrace renewables for energy security and industrial reasons or stall the fossil fuel endgame and prepare to cope with its implications.

## Introduction

The transition towards renewable energy is expected to have a fundamental impact on great power relations. The abundance of renewable energy sources, growing cross-border trade in electricity, stranded assets, and industrial rivalry will all leave their mark on great powers. However, great power rivalry itself will shape the speed and direction of the energy transition. A steady growth of renewable energy in the global energy mix is by no means assured in an increasingly multipolar or even fragmented world where myriad global and regional powers defend their economic and political interests. How will this reciprocal interaction play out? Will renewable energy depoliticize energy relations between great powers or will great power rivalry politicize renewable energy?

This policy perspective explores the complex interplay between renewable energy roll-out and great power rivalry. It first discusses how renewable energy impacts geopolitics and then how great power rivalry affects the energy transition. It then discusses the role that agency plays next to these systemic forces.

## Renewable Energy and Geopolitics

The presentation of the report *A New World - The Geopolitics of the Energy Transformation* to the International Renewable Energy Agency (IRENA) in January 2019 signalled a watershed moment. Before its publication, only a handful of scholars<sup>1</sup> had started exploring the geopolitical implications of renewable energy. Still, several geopolitical aspects of the energy transition had been studied in isolation, e.g., critical materials<sup>2</sup>, industrial competition<sup>3</sup>, stranded assets<sup>4</sup>, or high voltage direct current (HVDC) interconnections.<sup>5</sup>

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<sup>1</sup> Most notable are Criekemans, "The Geopolitics of Renewable Energy," 2011; Casertano, *Risiken neuer Energie*, 2012; Scholten and Bosman, "The Geopolitics of Renewables," 2013; Scholten and Bosman, "The Geopolitics of Renewables," 2016; Johansson "Security Aspects of Future Renewable Energy Systems," 2013; Hache, "La Geopolitique des Energies Renouvelables," 2016; Paltsev, "The Complicated Geopolitics of Renewable Energy", 2016; O'Sullivan, Overland, and Sandalow, *The Geopolitics of Renewable Energy*, 2017; Scholten, *The Geopolitics of Renewables*, 2018; Escribano, "The Geopolitics of Renewable and Electricity Cooperation," 2019.

<sup>2</sup> See e.g. World Bank, *The Growing Role of Minerals and Metals for a Low Carbon Future*, 2017.

<sup>3</sup> See e.g. Freeman, "China and Renewables," 2018.

<sup>4</sup> See e.g. OECD, *Divestment and Stranded Assets in the Low-carbon Transition*, 2015, Van de Graaf and Verbruggen, "The Oil Endgame," 2015.

<sup>5</sup> See e.g. Pierri et al., "Challenges and Opportunities for a European HVDC Grid," 2017; Smith Stegen, "Redrawing the Geopolitical Map," 2018.

Most research on energy geopolitics and energy security from an international relations perspective, however, focused heavily on oil and natural gas, especially shale gas, liquefied natural gas (LNG), and unconventional oil<sup>6</sup>, while more techno-economic works on renewable energy focused on its development, system integration, and market diffusion.<sup>7</sup> The field of political geography succeeded in relating notions of space and territoriality to renewable energy<sup>8</sup>, but general attention remained directed to climate and environmental politics.<sup>9</sup> Since the report, the topic has received increasing academic and political attention.<sup>10</sup>

The geopolitical implications of renewable energy can roughly be organized around six clusters of expectations that materialize at different stages of the transition.<sup>11</sup> To start, renewables' abundance implies a shift away from oligopolistic energy markets as many countries are able to produce larger parts of their needs domestically. Countries face a make-or-buy decision and strategic concerns change from access to energy sources and import-dependence towards availability at the right time due to intermittent renewables. Second, renewables facilitate more decentralized energy production by and for a more varied set of local actors, enabling new business models and local empowerment. Third is increasing competition for critical materials and know-how between countries that aspire to be industrial leaders in renewable generation technology and increasing political and economic relevance of countries possessing them. A fourth expectation is the electrification of energy systems (electricity is the energy carrier of most renewables) leading to regionalization of energy relations and managerial concerns due to long-distance losses in electricity transport and storage difficulties respectively. Fifth, energy markets will face shifting trade flows and shrinking volumes in trade in energy sources. An increased focus on flexibility instead of long-term deals is also likely. Finally, the process of creative destruction is already visible. On the one hand, we can observe industrial rivalry in clean generation technologies between the EU, the US, China, and others. On the other hand, we see worries about stranded oil and gas assets and related political unrest in fossil fuel exporting countries.

The transition towards renewable energy seems to both ease and intensify great power rivalry, the struggle for economic, political, and military dominance between great powers such as the US, the EU, China, India, Russia, and Japan. On the one hand, more domestic energy production, decentralized generation, trade regionalization (implying fewer entanglements in the Middle East and fewer overseas transport bottlenecks) take the sting out of energy vulnerabilities. On the other hand, industrial rivalry in clean tech, stranded fossil assets, access to material resources, and the control of new critical electricity assets will intensify rivalry between great powers in the energy domain.

Overall, the prospect of energy self-reliance and regional trade evokes a vision of a generally positive disruption, one that makes energy relations more stable because countries trade because they want to and can more freely select trustworthy or controllable partners. Still, changing generation supply chains, the resources needed for the new energy regime, and new HVDC interconnections raise new dependencies and energy security challenges, especially during the middle of the transition, when most new generation and distribution capacity will be installed.

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<sup>6</sup> See e.g. Yergin, *The Quest*, 2011; Pascual, *The New Geopolitics of Energy*, 2015; O'Sullivan, *Windfall*, 2017; Högselius, *Energy and Geopolitics*, 2019.

<sup>7</sup> See e.g. Haas et al., "How to Promote Renewable Energy Systems," 2004; Verbong and Geels, "The Ongoing Energy Transition," 2007; Ellabban, Haitham, and Blaabjerg, "Renewable Energy Resources," 2014.

<sup>8</sup> See e.g. Stoeglehner, Niemetz, and Kettl, "Spatial Dimensions of Sustainable Energy Systems," 2011; Bridge et al., "Geographies of Energy Transition", 2013.

<sup>9</sup> See e.g. Dalby, "The Geopolitics of Climate Change," 2013.

<sup>10</sup> See e.g. Goldthau et al., "Why the Energy Transformation Will Reshape Geopolitics", 2019; Overland, "The Geopolitics of Renewable Energy," 2019.

<sup>11</sup> Scholten, *The Geopolitics of Renewables*, 2018; IRENA, *A New World*, 2019.

## **Great Power Rivalry and the Energy Transition**

The energy transition will not take place in a vacuum. Seen from a geopolitical perspective, the world is undergoing fundamental changes. First, in terms of power distribution, it seems to be moving from a unipolar towards a bipolar or even multipolar system. With the economic, political, and increasingly military rise of China, US strategy has moved from the Atlantic to the Pacific and from counter-terrorism back to great power conflict. The EU, Russia, India, and others meanwhile form a patchwork of regional economic and military powers. At the same time, world politics seems to be one of fragmentation instead of multilateral cooperation. Contradictions between governments over decisions such as the route towards a renewable energy world—who is to pay and who will regulate that new regime—can already be detected today, for example between the US, the EU, China, and India in emission reduction talks. Much will depend on whether major powers dictate the rules of the game or if organisations such as the International Energy Agency (IEA) or G20 can develop an overarching regulatory and policy framework and foster a level playing field.

Second, the wave of globalisation that began in the 1990s seems to be in crisis. In practice, it privileged economic and political elites over the general population. Creative destruction made several key sectors irrelevant or no longer economically viable. Older industrial regions in the West, most notably in the US and the UK, have seen their economic and social fabric unravel as the twin forces of globalization and robotization progressed. Consequently, a new political movement of protectionism has sprung—of which Donald Trump could be seen as an emanation. This is now creating shockwaves that reverberate across the global system, as the multilateral trade regime is questioned and the current US administration tries to frustrate China's growth. Meanwhile, Beijing is spearheading new technologies in renewables and power distribution and implementing the 'One Belt, One Road' project of president Xi Jinping.

Third, great powers will also have to consider a number of developments and territorially embedded factors that affect their foreign energy policy. Technological innovations may open up new energy alternatives; environmental degradation and climate change can put new demands on the energy transition; and energy demand may shift from 'older' OECD markets to Asian markets. Country location, available critical materials, and renewable energy potential are also key explanatory factors. Some countries and regions are simply endowed with strategic advantages compared to others. Last, the level of economic development, vested business interests, and social and political stability are important parameters for a country's willingness and ability to invest in renewable energy.

Great power rivalry will undoubtedly impact the energy transition. Much depends, however, upon which future scenario unfolds. Today, one might expect an increasingly fragmented political and economic landscape where regional energy regimes—incorporating great powers and their spheres of influence—develop their own expertise and translate this into a source of power. In such a world, energy sources and carriers are traded within the regime, while competition for market shares in energy generation technologies and associated materials is central on a global scale.

Still, while a multilateral route with only win-wins seems unlikely at this point, it does not mean that climate urgency could usher in a new era of global energy cooperation picking up with a new Paris Agreement. Another scenario is that of energy nationalism, where domestic sources in combination with homegrown technological expertise (whether renewable, nuclear, or fossil) are developed to avoid dependencies. This may turn out to be a mirage as not every country can foresee their own needs. In a fourth scenario, these worlds get intermingled, creating an inconsistent patchwork with tensions between the value systems of the different parties in it. Obviously, each scenario implies a

different speed and direction of the energy transition, as obstacles to energy, material, or technology trade hinder a rapid uptake of renewable energy and shape the nature of energy systems and relations.

### **Strategies for Winners and Losers**

The outcome of the interaction between the energy transition and great power rivalry is difficult to foresee. Much depends on the role of agency in determining which systemic force will dominate foreign energy policies. Hence, it is worthwhile to consider how countries perceive the energy transition and are likely to act in order to reap the benefits while avoiding the drawbacks. In this light, it is useful to distinguish four categories of countries based on whether they are fuel importers or exporters and whether they are rich or poor.

The first group consists of ***fuel-importing rich countries***. It includes developed economies like the EU and Japan as well as emerging ones like China and India. These countries have the size, financial clout, and technological know-how to become industrial leaders in the clean energy race. They also have the incentive to make the switch because they are currently dependent on fossil fuel imports. If they can displace their fuel imports with home-grown sources of energy, they could benefit in terms of higher energy security, improved trade balances, and more strategic autonomy vis-à-vis exporter countries. Their economies will become less dependent on volatile fuel prices, which often oscillate in response to remote geopolitical events.

The second and biggest group are ***fuel-importing poor countries***, including the likes of Tanzania, Pakistan, and small island developing states. These countries can also reap huge benefits from switching from fuel imports to domestically-generated energy, as they suffer from widespread energy poverty, especially in sub-Saharan Africa. However, they often lack access to sufficient capital and technology to benefit from their renewable energy potential, let alone develop an industrial base around key future energy technologies. International frameworks are needed to assist these countries in transitioning to green energy sources and developing associated industries and jobs.

The third group is formed by ***fuel-exporting rich countries***, including petrostates such as Saudi Arabia, Russia, Kuwait, and the UAE. The natural resource wealth of these countries has accorded the rulers and regimes of those countries a significant degree of autonomy vis-à-vis their citizenry, but this social contract will probably unravel as oil and gas revenues start to dry up. While these countries may be tempted to deploy strategies to stall the oil endgame<sup>12</sup>, their only viable long-term option is to diversify their economies and become less reliant on oil and gas rents. Many petrostates have already developed diversification plans yet few have actually managed to implement them. Still, these countries have the financial resilience to allocate sufficient investment capital to nurture new industries, i.e., around cheap renewable energy.

The final group consists of ***fuel-exporting poor countries***. Here we are talking about countries such as Libya, Angola, and Chad, that were unable to balance their budgets in the wake of the 2014 oil price plunge. Their lack of significant foreign reserves puts them in a particularly perilous position. The regimes in those countries redistribute little of their oil revenue to the general population, but spending cuts could affect patronage networks and thereby provoke elite revolts. In recent years, such instability has often spilled across borders. Security pundits will need to gauge the situation in those countries closely, while the international community and development banks should look for ways to moderate the effect of oil and gas busts on these countries' economies.

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<sup>12</sup> Van de Graaf and Verbruggen, "The Oil Endgame," 2015.

It is important to underline that global energy trade will tilt towards countries' 'normal' instead of 'natural' competitive advantages. Hence, some countries could strengthen their geo-economic position by becoming a leader in certain key technologies (5G, smart energy systems, storage, high-voltage transmission, etc.), while others could create revenues from exporting critical materials (e.g. lithium or neodymium), electricity, or hydrogen. However, it is hard to imagine these countries earning the same amount of revenues from the export of technology, materials, or electrons in the future as petrostates have earned from fossil fuels in the past.

## **Conclusion**

The energy transition and great power rivalry will undoubtedly leave their mark on each other. Renewable energies shift areas and locations of conflict, while geopolitics frames technical choices and trade patterns. Together, they shape future energy systems and relations. How countries will position themselves in the energy transition, however, will become crucial in determining the outcome. Some countries and regions in the world are endowed with geographic advantages compared to others, but political agency and willingness to invest in renewable energy technologies will still be important. For instance, a lack of resource access to cobalt, nickel, or lithium for electric car batteries can be compensated via a critical materials strategy and foreign policy. This means that there needs to be a dialogue between those two epistemic communities: energy and climate modelers, on the one hand, and military strategists and planners, on the other. There is still a dearth of scholarship on the issue, and many practitioners are not properly preparing for the changes that are afoot.

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