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## *Introduction: Energy Policy on the Edge*

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This book is about the political economy of energy. There are few more consequential topics for understanding today's global economy, for global development, or the very well-being of humankind.

Energy isn't always thought of as being essential to the fabric of the global economy, or to development—but it should be. This can be dramatized by juxtaposing three simple facts.

*Energy goods account for almost one out of every five dollars traded in today's global economy.* That makes it one of the largest sectors in contemporary globalization. Only finance is in the same league in terms of shares of global economy activity.

*Despite the huge volumes of energy being produced and consumed, more is needed: 1.3 billion people live without access to modern energy.* This is not a phenomenon primarily of the world's poorest states, but of its most dynamics ones—there are upward of 300 million without access to modern energy in India alone, a state otherwise poised to join the ranks of the top powers. Securing new supplies for the world's energy insecure is going to be among the most critical tasks of development in the coming decades.

*Yet, we're already burning more fossil fuels than our climate can handle.* The drive to expand energy access and security will complicate and be complicated by the mounting fight and fright over global warming. The vast majority of the world's scientists agree that to stabilize the global climate at a less than 2°C rise in average global temperatures requires keeping the quantity of carbon and other greenhouse gases in the atmosphere at around 450 parts per million. Right now, we're at

403 ppm and we're on track to hit 650 ppm—and that's *if* governments meet the climate targets they agreed to in Copenhagen in 2009. Growing demand for energy by the world's rising states and growing middle classes puts that target comprehensively out of reach even if we see something approaching the full-scale decarbonization of the economy in the West—a near-impossible challenge.

The long and the short of it is, energy is emerging as a defining feature of globalization, of global development, and, of course, of climate change. Indeed, if the first phase of modern globalization was about its geographical spread (what's been called *extensive* globalization), and the second was about the deepening of economic integration between existing markets (*intensive* globalization), there's a case for arguing that the next phase is going to be heavily about energy—its acquisition, transportation, and, most importantly, the debate over whether to constrain its use. Call it the phase of *sustainable* globalization.

It's also reshaping geopolitics. In a book published simultaneously with this one, Bruce Jones and David Steven examine the geopolitical consequences of the changing global energy landscape. *The Risk Pivot: Great Powers, International Security, and the Energy Revolution* focuses on the way energy is amplifying three already complicated problems: geopolitical competition between the great powers; the struggle over global development in the new middle powers, as well as in fragile states; and global climate change negotiations. The book highlights the critical choices facing the top powers. As we see it, these are three: whether to allow energy to continue to be a source of geopolitical tension for globalization; whether to choose deliberately to use energy as a source of additional tension, that is, to use energy as a political and economic weapon against one another; or whether to forge a “governance” approach, that is, to build the relationships, rules, and mechanisms to limit the way energy amplifies tensions and, by contrast, to find areas—and important ones do exist—where energy is a source of win-win outcomes and thus of potential cooperation.

While those outward themes echo through this book as well, our concentration here is *inward*—on the way energy plays into the internal political economy of major states, and on their search for internal and human security (though not neglecting regional security). Geopolitics and international war get a prominent mention herein too, because they cannot be wished away even from the search for more basic forms of security, like food security and internal political stability. But our emphasis here is on the search by major states for secure national “control” (if that word meaningfully applies to global energy dynamics) over the sources of their internal growth and social well-being. Energy plays vitally into that search, especially for the rapidly growing powers.

This book proceeds as follows. We look first precisely to those rapidly growing powers, to examine how it is that energy is literally fueling and simultaneously

complicating their rise. These chapters cover the three most important rising powers—China, India, and Brazil. But we also include an analysis of a rising state often overlooked, Nigeria—the seventh most populous state in the world, larger than both Russia and Japan. Then we turn to various dimensions of security, between states to be sure but primarily within states—incorporating key dynamics of human security in our analysis. We examine regional security (between Asia’s two giants and in Europe’s backyard); the way energy-producing regimes often use energy as a weapon in regional or even global political struggles; and internal security. These chapters incorporate what we might consider status quo actors, like the European Union (EU) and Saudi Arabia—though as the chapters make clear, even these countries face serious challenges to their own status quo. This part also incorporates Russia—often considered to be a “rising” power, but for all intents and purposes really a slumping one.

Then, finally, we look at both the internal and international dimensions of the one state whose energy developments will most shape and constrain global ones: the United States. It may seem odd to treat the United States this way, given the mostly dominant narrative that it is a declining and retreating power. The realities are different. Seen through the lens of energy, the United States is part way through a stunning renaissance. These do not eradicate other sources of U.S. challenge or constraint, but they do substantially offset them. And the energy revolution in the United States is a function first and foremost of the dynamism of the American market model—a fact that has not gone unnoticed in Mumbai or Shanghai, even if it’s not yet fully acknowledged in New Delhi or Beijing. Important questions remain for the United States. These are first of all internal—how will it respond to a series of U.S. political economy challenges? But they are also external—will it use its new-found energy strength to attempt to shield itself from international dynamics, retreating into a more isolationist stance? Will it seek to use its energy endowment as a “weapon” of foreign policy? Or will it use its energy strength as a lever to push for more stable markets?

## **Unsustainable Developments: Energy and the Rising Powers**

We start by looking in depth at the internal challenges of energy in the world’s most dynamic markets. China and India are obvious targets of that analysis, as the world’s two most populous states, and the core of the Brazil, Russia, India, China, and South Africa, or BRICS, grouping. Brazil is not as populous as either state, but it’s richer, and so has already thrust its way into the ranks of the top six economies, topping Britain; and it’s done so in substantial part because of its ability to harness its own vast energy and food resources. And Nigeria: the world’s seventh most populous state doesn’t show up on everyone’s account of rising state dynamics of the past decade, but it will in the next. At least, it will

if it can overcome some deep internal challenges—Nigeria is both a rising state, and a fragile one, a dichotomy that increasingly will characterize the next set of rising states.

If one theme connects the dots between this otherwise disparate set of countries, it is energy insecurity. This is true even of the largest and most successful of them to date, China.

The simple fact is that as China grows, its demand for oil and other forms of energy grows, and so too does the complexity of its search for energy security. In “China’s Search for Oil Security: A Critique,” Andrew B. Kennedy analyzes the ways in which the Chinese government has sought to enhance its access to oil supplies, focusing on four policies that aim to improve access to oil supplies.

For more than a decade, the Chinese government has encouraged its national oil companies (NOCs) and other state-owned enterprises to “go out”—to invest overseas and gain greater access to foreign resources. However, the results of going out have been limited. While the Chinese NOCs’ overseas equity production surpassed 1.5 million barrels a day in 2011, that’s only a fraction of global crude oil production at 84.5 million barrels a day. Furthermore, the NOCs do not necessarily send the oil they produce back to China, and it is not necessarily cheaper or more available to China in a supply crisis. Lastly, there is concern that the NOCs’ international expansion may actually detract from China’s overall welfare and security as the expansion brings China into relationships with isolated states like Iran. (This theme of political risk increasingly flowing to the emerging Asian giants is a central theme of *Risk Pivot*.)

In addition to encouraging its own NOCs to go abroad, China has sought to diversify its energy import mix through “loan-for-oil” and “loan-for-gas” deals, as well as try to diversify the routes that its oil shipments follow. Yet, though the loan-for-oil deals will improve China’s overall energy security by reducing its reliance on imports from the Middle East and Africa, the effects will likely not be large.

Also, recognizing the great percentage of its energy that travels through open waters, China has been working to improve its blue-water navy. In theory, a stronger navy would improve China’s leverage in its territorial disputes in the East China and South China Seas, helping it to gain control over energy resources there. However, it remains unclear how extensive the energy resources are, and in any case it is unlikely they would dramatically reduce China’s dependence on oil imports.

Last, China has been building its own strategic petroleum reserve to strengthen its energy security. This investment has the potential to make a significant contribution to the country’s energy security, as it provides Beijing with new policy options in the event of a disruption to oil imports. However, it would be more effective if it were used in coordination with the reserve systems of other countries.

While Beijing has been trying to build up domestic capabilities and bilateral deals with oil-producing states, the payoff for China's energy security has been limited. Going forward, Kennedy argues, China will need to invest in stronger multilateral cooperation to truly enhance its energy security.

If anything, India faces starker challenges still. As India's economy and population grow, so too does its resources challenge. Energy, water, food, and environmental challenges will continue to present themselves globally, but India provides a powerful illustration of how complex and deep these challenges are. Domestically, inadequate infrastructure, intense political pressures, and the need to tackle poverty all constrain India's options with regard to resources.

Thus, in "Materials, Markets, Multilateralism: A Strategic Approach to India's Resource Challenges," David Steven and Arunabha Ghosh argue that while resource scarcity will play an important role in shaping India's future, it is unclear that India will be able to change the game domestically. More likely, global drivers will help frame what is possible within India's domestic policy environment: India's exposure to the breakdown in global energy markets could grow; the country's size does give it considerable power in the food market; transnational water stress issues may prove unmanageable in the medium term; the intersection between maritime and energy security could become a source of international friction; and climate change politics will become increasingly challenging.

However, the global governance regimes that deal with the issues that India most cares about are both weak and contested, and India often lacks a clear strategy for its international engagement. Both India and its allies, therefore, have an incentive to look for opportunities for international cooperation on resource and environmental issues. Greater international engagement can help increase understanding of the risks that India faces, provide India with a platform to share potential solutions with its partners, provide a basis for Indian leadership in the G-20, and help India influence the post-2015 development agenda. But to take full advantage of more decisive international engagement on resource issues, India will need to increase its capacity to engage internationally.

Brazil has had an easier time so far, as it is well endowed with domestic resources. Of the emerging powers, it's the country that most resembles the United States in terms of its providence and commitment to global norms. No surprise, then, that as energy insecurity has receded as an internal challenge for Brazil, it has turned its gaze outward. As Antonio Jorge Ramalho argues in "Brazil's Principled Pragmatism: A Viable Response to the New Geopolitics of Resource Competition?," Brazil's concern increasingly is not its internal energy issues, but its external ones. As the world population and developing economies expand, Brazil is preparing for a world with increased demand for resources and attempting to position itself to take advantage of the opportunities such a world offers.

Brazil sees a strong link between development and security. As resource scarcity grows, it sees a greater potential for international conflicts. To cope with this possibility, governments need a legitimate global response that will allow countries like Brazil to enlarge their supply of biofuels. Brazilian policy emphasizes the argument that to sustainably grow, these governments must respect both human rights and the environment, suggesting that sustainable development and social inclusion need to be part of the response. Brazil, which is already in the process of reducing subsidies to Petrobras and relies on small farms to provide more than 40 percent of the country's total agriculture, believes that it can become a model of sustainable development for other developing countries, and that it can lead on the articulation of multilateral frameworks to advance these goals.

Nigeria has no such luck. Domestic demand in Nigeria is shaped primarily by two forces—a growing, urbanizing, and slowly aging population, and a growing but unstable economy. Nigeria's population has more than quadrupled since 1950, and most of the population is now adult and increasingly urban, creating significant demand for food, water, land, power, and other resources. Further increasing resource demand is Nigeria's oil-dependent economy, an economy that is large for the region but still does not provide jobs for its population. Overall, consumption exceeds production, with natural resource revenues, debt, remittances from overseas, and development assistance filling the gap.

These factors combined create the possibility of a demographic disaster, coupled with a steep growth in domestic resource demand. Nigeria—Africa's biggest oil producer—has already failed to meet domestic energy requirements, and the gap between supply and domestic demand will continue to grow without major reforms. In addition, a growing population will put increased stress on Nigeria's land, food, and water resources, and this stress will likely be exacerbated by climate change.

Looking forward, then, Mark Weston in “The Big Squeeze: Nigeria on the Brink” sees three broad scenarios ahead: the good, the bad, and the ugly. *The good*—Nigeria begins by reforming oil and gas production, reducing waste, and taking much stronger measures to limit damage to the local environment. The Nigerian government has already taken two important steps toward this outcome: investing excess profits in three funds (one for the long term, one for shorter-term investments, and one for stabilization) managed by the Nigerian Sovereign Investment Authority; and becoming more involved with the Extractive Industries Transparency Initiative. In this scenario, Nigeria's international partners play a key role by allowing more Nigerians to migrate legally to find work, reducing transnational crime by legalizing narcotics, and holding their businesses in Nigeria accountable. *The bad*—If Nigeria continues with business as usual, its prospects of meeting domestic and international demand for

resources will be bleak, with problems beginning at a local level likely to spread to the whole country and perhaps to the wider West Africa region. And *the ugly*—In this scenario, the country reverts to the military dictatorships of its past or descends into civil war. This would in part be caused by increased difficulty in investing in the impoverished, troubled north of the country.

The effects of the country's failure to capitalize on its human and natural resources have so far been limited to widespread and growing poverty and intermittent localized unrest, but the consequences of continued failure over the next two decades are likely to be much more serious. Nigeria does not lack resources or the human capital required to make use of them. Until now, however, it has lacked the leadership and the vision to realize its potential, and this has left it delicately balanced between feast and famine as it prepares for a more crowded, more demanding future.

Perhaps even more than India, Nigeria illustrates what's ahead as we grapple with (un)sustainable globalization.

### **International, Regional, and Human Insecurity: The Modern Dynamics of Energy**

Nigeria and other developing states may face the toughest challenges, but even today's most established energy players can't escape the consequences of turbulent global realities. That's true for Europe, exposed to serious energy security risks through its reliance on Russian imports—a reality that Europe was exploring, but not really grappling with, before the Ukraine crisis. Energy complicates regional security, as India and China—potential partners, practical rivals—are discovering. It also complicates internal stability, as Saudi Arabia is discovering. Saudi Arabia is still the country whose oil exports will do most to affect the global price of oil, but it is now a country facing serious internal political economy constraints around energy use and domestic instability. And all developing states confront both short-term food insecurity and long-term water insecurity as a consequence of global energy and climate patterns. Most states have to tackle these issues internally; some, notably petrostates, sometimes try to export them, including by financing revolutionary politics overseas, or, in the case of Russia, positioning itself to profit from instability in global markets.

Europe's search for greater energy security has, until now, largely been a story about pipelines. As Angel Saz-Carranza and Marie Vandendriessche outline in "Routes to Energy Security: The Geopolitics of Gas Pipelines between the EU and Its Southeastern Neighbors," Europe was engaged in an exploration of alternatives to relying on Russian pipelines well before the Ukraine crisis. As the world's energy flows evolve, Europe is scrambling to respond to the new

energy outlook while simultaneously confronting classical geopolitical issues with Russia.

The European Union is highly reliant on imports for energy (it imports 54 percent of its energy needs), and although Europe is working toward a low-carbon economy, it will likely remain so. The European Commission has identified three main policy tracks to improve its security of supply. First, continue exploiting and increasing indigenous energy sources such as renewable energy, domestic reserves of conventional and unconventional fossil fuels, and nuclear energy. Second, improve energy efficiency, including deploying smart grids and having all member states meet the previously agreed objective of ensuring electricity interconnections equivalent to 10 percent of their installed production capacity. Third, and most difficult, diversify supply countries and routes for imported fossil fuels. Natural gas is increasing its share of the EU's energy mix—currently at 24 percent—and forms the centerpiece of an intricate geopolitical competition to the EU's east. There is no such thing as a global natural gas market: natural gas is produced, transported, and traded through regional, fragmented markets. Its pricing also displays regional differentiation. A further particularity of natural gas as an energy source is the importance of transit countries. As demand for gas increases and production from landlocked countries grows, supply arrangements increasingly operate through transit countries. Of course, arrangements through transit countries are more prone to disruption than direct exporter-importer relations. In addition, the more intermediaries there are in the equation, the larger the set of diverging economic interests. The EU's campaign to diversify its energy imports away from Russia must take this important factor into account at all times: its efforts inevitably involve transport through additional states.

One-third of the EU's natural gas needs are met by Russia. Many have argued, through a *Realpolitik* lens, that Russia wields its energy policy as a foreign policy stick, but recent global gas developments may threaten Russia's power source. The EU-Russia gas relationship is currently symbiotic: while the EU relies on Russian gas to keep its houses warm, so too is Gazprom reliant on the EU—the market to which it sends over half of its exports.

As noted above, key to Europe's energy security strategy is diversification away from Russian gas and insecure transit routes. To this end, the EU's main approach has been the construction of a fourth energy corridor, the so-called Southern Gas Corridor (SGC), in order to better access supplies from Southeastern Europe and the Caspian. After much strenuous commercial and political effort, the agreed approach forward will provide Europe access to a Caspian source, but deliver just 2 percent of its future gas needs. In other words, the EU has partly achieved its policy objective of diversifying supplies, but at 2 percent the shift is far from epic. Unless sharp crises such as the 2014 Crimea one lead to rapid and creative



policy reconsiderations (and beyond simple *calls* for an “energy union” to actual supranational cooperation), the EU is set to depend on Russia for gas for the foreseeable future. Europe still has a long road ahead in its quest to further diversify suppliers, increase domestic extraction, and shift to alternative energy sources.

Europe is not alone in worrying about its immediate neighborhood; so do China and India—but principally, they worry about each other.

The energy security strategies of China and India have been described as “realist” approaches that are fundamentally opposed to market-based strategies seen around the globe. And the NOCs’ quest for investments in oil and gas is often perceived as the single most important energy security strategy of the two countries, portrayed as a zero-sum game for energy resources that will undermine energy security for the rest of the world, and a precursor to a more fundamental military conflict between China and India.

C. Raja Mohan and Lydia Powell examine the validity of these narratives, claiming that while policy goals such as self-reliance do contradict the market philosophy, the goals are not necessarily driven by a nationalist agenda, nor will NOCs undermine the reliability of the global oil market. Instead, as they argue in “Energy Rivalry between India and China: Less than Meets the Eye?,” the policy goals are often suboptimal compromises between domestic energy challenges and international market and regulatory pressures.

The assumption that Chinese and Indian energy strategies compete with each other and may lead to larger geopolitical confrontation needs to be closely assessed. For many, China and India are seen as natural rivals and the competition between their NOCs seen as one of the many manifestations of a long-standing animosity. However, to treat the two countries’ NOCs as equal is to err; the difference between Chinese and Indian NOCs is larger than the difference between the Chinese and Indian economies, and the success of Chinese NOCs over Indian NOCs illustrates the extent to which commercial logic rather than geopolitical preferences underpins the competition between Indian and Chinese NOCs.

On the whole, a combination of commercial necessity and opportunity seems to be driving the international pursuits of Chinese and Indian NOCs, while government policy seems to be driven by domestic industrial policy along with a sense of historic grievance and fear. The risk of a possible military clash between India and China over energy transport corridors cannot be entirely dismissed. India straddles the sea-lanes through which most of China’s imported oil passes, and segments of the Chinese strategic and military community are concerned with the potential of the Indian navy to interdict China’s maritime oil lifeline. In an atmosphere of mutual suspicion, military planners in China and India seem to be formulating strategy based on the worst-case scenario. However, it may be more appropriate to look at China’s investment in maritime power to secure

energy transport corridors as a response to the United States' continued command of the maritime commons and India's potential role as partner.

As the line between energy concerns and larger economic and environmental predicaments is increasingly blurred, both countries realize that their energy problem is no longer a short-term foreign policy problem, but a long-term transition to a different and more expensive mix of energy sources and unwelcome changes in the habits and institutions of their ambitious societies. However, though the state is still powerful in the realm of deciding energy policy in both countries, the high level of institutional fragmentation means that achieving consensus on policy is just as hard domestically as it is internationally. To ask them not to grow is equivalent to trapping millions of lives in poverty, yet to let them grow on fossil fuels is equivalent to trapping the world in climate change. In this context, from where and through whom India and China get their fossil fuels is far less important than the choices that India and China make regarding the types of energy they will use in the future.

While Europe, China, and India grapple with the external constraints on energy security, Saudi Arabia is grappling with its *internal* ones. "Resource Security in Saudi Arabia: Domestic Challenges and Global Implications," by Kristian Coates Ulrichsen, reveals that Saudi Arabia is facing a transformative shift in its local and global energy landscape, as domestic consumption pressures challenge the redistributive political economy of the past; Saudi responses to the Arab Spring and similar movements have exacerbated the challenge of sustaining resource scarcity; and trends in oil and gas production will shift the center of the international energy market away from the Gulf. The dilemma facing Saudi policymakers is one of balancing domestic sociopolitical stability against urgent needs to reform and diversify economic structures.

Saudi dependence on oil revenues has been intertwined with state building and economic development since the 1950s. Following the death of King Abdul Aziz Al-Saud in 1953, the processes of modern state formation were intricately connected to the receipt and redistribution of revenues generated by the export of oil—a system confronting interlinked threats to its existence. Saudi Arabia's redistributive economic model faces four major challenges in the years ahead—two internal and two external. The domestic factors are the increasingly unsustainable pattern of domestic energy consumption as well as uncertainty regarding oil reserves, while the international dimensions are, short term, the possibility of a protracted global economic downturn and, medium and longer term, the rebalancing energy landscape across the world. As domestic and regional resource constraints become more pressing, managing the processes of change will become progressively more difficult. The fact that sensitive internal reforms to the sociopolitical and economic structures of rent redistribution must now be undertaken

against the backdrop of profound regional upheaval will inject major new uncertainties into the regional security landscape.

Furthermore, the rapidly rising breakeven price of oil needed to balance the budget and the impending succession dynamics within Saudi Arabia increase the likelihood of political volatility. The steady rise both in public spending and in the breakeven level leaves the Saudi government (alongside the other Gulf States) dependent on oil prices remaining high. Any significant drop would leave them economically exposed, and political leaders fear the potential unrest that could ensue from scaling back the oil-funded redistributive state, particularly if it occurs during times of hardship. Happening in parallel to these economic challenges is the imminent political transition in Saudi Arabia as King Abdullah bin Abdul Aziz Al-Saud nears 90 and his designated successor, Crown Prince Salman bin Abdul Aziz Al-Saud, stays in poor health.

A potentially rocky road thus lies ahead for Saudi Arabia, both domestically, in terms of sustainably managing trends in the production and extraction of resources, and internationally, in terms of adapting to the shifting geopolitical balance of resources. Policymakers must be able to operate between and across the two levels in order to address the interrelated issues in an integrated way. The political economy of rent redistribution and patterns of energy-intensive industrialization mean that Saudi Arabia—and the GCC as a whole—must strike a balance between shaping global response mechanisms and decisionmaking processes while simultaneously minimizing the disruptive threat to domestic interests from pressure exerted by international responses to climate change. It also is likely that the coming years and decades will see a rising tension between the need to decisively shift into a post-oil era while seeking to maintain the sociopolitical models that have underpinned regime stability thus far. Against all these domestic uncertainties, the intersection of local and regional trends across the Arab world, with global shifts, has the capacity to produce volatile, even game-changing results. With this in mind, the only certainty is that the status quo that seemingly has survived the first phase of the Arab Spring upheaval cannot be sustained for much longer, and will, eventually, be transformed.

Saudi Arabia's challenge is particularly acute, but it is not unique. Indeed, most states outside the West—and even, to a certain extent, within the West—are grappling with rapidly evolving global markets and their impacts on internal developments. Food is one of the most immediate places that those new global developments are playing out politically, almost always for the worse.

Since the global financial crisis, food price volatility has been pronounced. Indeed, Alex Evans starts “Governance for a Resilient Food System” by highlighting that in the period of 2010–12, some 852 million people in developing countries were chronically undernourished. Part of the reason is simply that the

supply and demand fundamentals for food have become progressively tighter in recent years. The convergence of the world's food and energy economies is also emerging as a key factor in food price inflation and volatility as the dependence of modern agriculture on fossil fuels grows and biofuels become more attractive. Also important is the fact that as food supply chains have become more globalized and efficient, they have also become more brittle and less resilient. Above all, a more globalized food system equals a more interdependent one too—which makes the system vulnerable when governments or other key players succumb to panic or herd behaviors.

Four key areas for action against food price volatility and for food security stand out. First, making markets work better. Measures are needed to improve markets in periods of tight supply and demand, including food reserves, more effective regulation of commodity futures, and improved market transparency. Second, reducing the risk of global zero-sum games with food. Ways are needed to reduce the risk of zero-sum games such as panic buying and export bans, protectionism in agricultural trade, and the need to balance countries' right to decide their own policies with their international responsibilities to their trade partners. Third, building resilience on the ground and improving access to food. More work is needed in developing countries, in particular, to improve access to food by scaling up social protection systems. Fourth, addressing long-term supply and demand fundamentals. More investment is needed in a "twenty-first-century green revolution" that improves output, while reducing resource intensity and using land and crops more efficiently and with less waste.

Evans's chapter is neither the first nor the last time we encounter an important subtheme of the volume: the reality that there is a lack of leadership and political space for collective action on resource security, but in addition, current multilateral institutions are badly configured to support and facilitate such action. More broadly, decisionmaking bodies that focus on only one issue struggle to take account of the big picture, often because they only engage one kind of policymaker. The underlying long-term need is for much more shared awareness and interoperability between governments and international organizations.

Like food, water dynamics are similarly important. But water systems work differently than food systems. While water is a global necessity, it is also deeply specific to national and local context, especially as climate change affects various regions dissimilarly. Water use is a transnational challenge—but one that differs from others with subtly distinctive characteristics and therefore responses. "Water Security: Global Implications and Responses," by Daniel Kim Chai Yeo, frames water security as a crosscutting challenge in the context of global resource scarcity and reflects on the role of national and international policy in addressing water security challenges.

Water is one of the most basic human needs, essential for drinking, cooking, washing, and cleaning. But it is also an economic resource, vital for growing crops, keeping livestock, producing goods, and providing services. This distinction between economic and social value has been a core tension in historical attempts to fashion multilateral responses to water. Water also affects other resources, particularly the production of food and generation of energy, and this interdependency between resource issues can act as a multiplier, amplifying local issues into systemic impacts. Water challenges affect every scale of society, from the community to the nation and beyond. But responding to water challenges at one level comes with its own consequences, often unintended, at other scales.

Although there are specific areas where competing uses of water clash with physical or temporal scarcity, outside of these hot spots it is the role of water in other resources that raises the biggest global challenges. The chapter highlights some of these national dimensions through a case study of Ethiopia, a country that encapsulates many of the biggest water challenges and illustrates some water issues that have been insufficiently addressed. Ethiopia has a very difficult climate, with diverse water security concerns at subnational, national, and regional scales. Perhaps most important, the government has demonstrated the political will and leadership to address these, but has limited resources and capacity to do so. The Ministry of Water, Irrigation, and Energy has chosen to focus on three water-sector areas: hydropower, irrigation, and access.

Ethiopia's very ambitious plans will require significant monies and capacity to deliver. Although Ethiopia is willing to commit its own funds to achieve its ambitions, it currently lacks the domestic financial resources to finance them and so will require considerable international support. But this support has not been forthcoming, because international opinion and concerns over environmental and social impacts have deterred development partners from investing in dams and large-scale irrigation. In addition to underinvestment, the practical delivery of Ethiopia's bold political ambitions risks being undermined by weak implementation capacity at the regional and subnational levels. On top of the institutional and political challenges, weather and climate play a defining role in managing water. Ethiopia, as with many countries, will require more support internationally. Given that Ethiopia's water security can have global implications, there is a clear need to take a coordinated and focused multilateral approach to supporting the country in responding to the complex and crosscutting challenges of water.

The case of Ethiopia highlights some practical issues at a national level. In particular, international support is a key element of domestic ambitions. But how far can the global architecture address a local issue? The evidence to date suggests that there is a long way to go. In institutional terms, the global architecture for water lacks strategic coherence. Furthermore, the complexity of water

and the range of issues involved are not currently adequately reflected in political or popular discourse. Instead, global narratives of scarcity, conflict, and drought-induced disaster dominate, pointing to economizing and efficiency as the solutions, often with a strong technological bent.

Yet, responding to the complexity of water requires a multilateral architecture that seeks to enable and facilitate national change rather than prescribe solutions. Any global agenda must frame a common set of issues that encompass the full range of water dimensions, to include providing universal access, staying within natural constraints, and sharing benefits. How could multilateralism help to support and enable these outcomes at a national level? It could set a common agenda, develop evidence-based decisionmaking, broker collaboration and implementation, resolve conflict and build trust between actors, and share technical assistance and knowledge.

So far, we've been discussing the ways in which energy and related resources amplify internal political and economic challenges, and some potential state responses to mitigating those challenges. But some states select a different path: they choose to export those risks. That is, as Jeff D. Colgan makes clear in "Oil, Domestic Politics, and International Conflict," some states choose not to try to mitigate the internal political economy challenge, but to fuel instability abroad both as a way of buying off potential domestic rivals, channeling their attention outward, but also as a way of influencing global political dynamics that otherwise constrain them. This phenomenon is particularly prevalent among petrostates.

Petrostates—any country that has an annual net oil export revenue of at least 10 percent of its GDP—have a number of characteristics in common, all of which fall under the category of "petrostate syndrome." Domestically, the syndrome includes suffering from the "resource curse" and a proclivity to provide energy subsidies. In terms of foreign policy, petrostates typically have elevated military spending, large foreign aid donations to other developing countries, funding of foreign insurgencies or terrorists or both, and checkbook diplomacy.

While petrostates share many similarities and common behaviors, they differ systematically in at least one important respect: the degree to which they engage in aggressive foreign policy. This difference is caused principally by the preferences and beliefs of the country's political leadership, which is shaped largely by how the government came to power—and particularly if it came to power by means of a domestic revolution. "Petrorevolutionary" states are roughly three and a half times as likely to instigate a militarized interstate dispute than are non-revolutionary non-petrostates.

These two factors—oil income and revolutionary government—interact in a complex way. For states in which a revolutionary government has taken power, oil increases the state's propensity to instigate international conflicts. In

non-revolutionary states, oil provides incentives for aggression, but these are balanced by incentives to avoid international conflict. In other words, the opportunity costs of disrupted oil exports do not really change if the petrostate's government is revolutionary, but the domestic political costs and the calculation of political benefits do change. Thus in a non-revolutionary context, oil appears to have little net impact on a state's propensity for international conflict.

These findings can contribute to a policy framework in three ways: first, by informing intelligence estimates (the elevated conflict propensity of petro-revolutionary states should be taken seriously, perhaps more seriously than it has in the past); second, by reinforcing an existing set of reasons why it is desirable to reduce global oil dependence; and third, by providing further incentive to support institutions that avoid or mitigate the resource curse in oil-producing states.

Of course, the world's most important petrostate is Russia, and it plays what's simultaneously a more complex but also potentially destabilizing game. Pavel K. Baev, author of a chapter on Russia, uses a revealing title: "Russia Gambles on Resource Scarcity: Energy Intrigues in a Time of Political Crisis."

Though Russia is home to many varied natural resources, its economic development has slowed to a 2-3 percent crawl after the 12 percent contraction in 2008-09. This diminishing output in Russian extraction industries cannot be explained by the impact of the global financial crisis alone, but can be attributed primarily to intrusive state policies that set ambitious goals and seek to turn export strength into political influence but also exhibit predatory practices shaped by massive corruption.

Street protests in Moscow in December 2011 prompted a crisis in the legitimacy of Putin's regime, the results of which appear in political zigzags in any number of policy issues. The centrality of energy in Putin's management of state affairs has been somewhat diminished by the commitment to prioritize other urgent challenges, and decisionmaking on energy policy is more than ever shaped by conflicting demands and crisis-driven changes of direction such that short-term imperatives take priority over long-term strategic priorities. The crisis of Putin's regime increases the uncertainty and aggravates the distortions in the energy sector because political control is tightening but losing coherence.

Putin's broader economic strategy has also shifted in principle, from making the country an energy superpower in the early 2000s to moving toward a "reindustrialized" nation with substantial effects on the energy industry. Recreating giant Russian manufacturing enterprises requires a lot of cheap energy and consumes great volumes of raw materials. The demand for more energy, at a cheaper cost, has contributed to a disengagement from innovations in the global energy market, relying instead on traditional (and climate-damaging) methods of extraction and production.

At the same time, Russian gas exports to Europe have become increasingly complicated. From the early 2000s, Russia saw the main problem for expanding its European exports as transit. In oil, Moscow successfully resolved this problem by building terminals in Primorsk and Novorossiysk, while also controlling a channel for oil exports from Kazakhstan and accepting the opening of the Baku-Tbilisi-Ceyhan pipeline. More complex and less successful has been Moscow's management of gas transportation and exports to Europe in general. The execution of the ill-conceived policy of opening new export channels toward the saturated European market has brought endless complications in Russia's relations with two of its key gas partners—Ukraine and Turkey.

Facing difficulties to the west, Russia can thus look east to diversify its energy markets. However, progress in this direction has been slow, largely due to its profound unease in its relations with China.

All of this points to a Russia that places less emphasis on its long-term strategy and more on short-term gains. Russian mainstream analysis of global energy developments tends to be not only rigidly conservative but also self-serving, so that only the trends that fit the interests of the stakeholders are recognized as real. Russian energy-political strategizing has been based on the idea of a golden age of gas, but the realities of such a transition support competing sources and price fluctuations rather than a Russian resurgence. In oil, Russia faces the challenge of potentially lower prices as Saudi Arabia, the United States, and possibly Iraq increase their output. With nuclear energy as well, rigid state control keeps it on a static track instead of seeking new innovation.

The globalized world is typically seen as more brutally competitive than it really is, but this vision is not translated into readiness to invest in strengthening Russia's competitiveness. Natural resources can be a major source of strength if developed responsibly, but they can also sustain bad policies—and Russia has turned itself into a test case for this sustainability.

## **Decaying Power, Rising Power? The United States and Its Global Implications**

And then we encounter the United States. The U.S. has gone through its own revolution—a shale revolution, and a tight oil revolution, that have seen it re-emerge as a dominant global energy producer, outstripping both Russian gas production and Saudi oil production in 2013. Many forces within the country have treated this revolution and its impact on American foreign policy with something akin to euphoria. Reality is more complex.

We start with America's internal political economy. As Joshua Meltzer, David Steven, and Claire Langley make clear in "Challenges to Sustainable Growth



after the Great Recession: How America Can Lead,” post–global financial crisis America’s economy has some substantial difficulties ahead.

The 2000s brought a slew of unease to the U.S. financial system, and now the United States faces a number of long-term threats: (1) competitiveness is being eroded, (2) the economy is struggling to generate sufficient new jobs, (3) many workers aren’t seeing an increase in their earnings, (4) American investment in infrastructure and human capital is slackening, (5) growth has been driven by high levels of indebtedness, (6) there are growing fiscal pressures, and (7) the U.S. economy is affected by broader global imbalances. Socially, this all means that while overall Americans are richer, healthier, and better educated than they were after WWII, a number of negative trends prevail, particularly increased inequality and a decline of economic mobility. Though international trends have contributed to these problems, inadequate education, tax and transfer payments, labor regulation, and housing cost regulation have also hindered mobility and equality. And there are environmental consequences to the growing economy.

Further driving unease is a strong divide about how the country should address these long-term issues. While demographics offer a picture of a more competitive America in terms of population growth and age, age and race divides may contribute to a political realignment. And though this change suggests that the political system will drive more decisive action, the country’s political system is likely to remain indecisive. While polarity is growing, so is a loss of trust in the elites and in general. The view is not totally negative, however—this gridlock may actually create space for other actors to challenge the status quo, and the country maintains a number of absolute geopolitical strengths, including its security strength and growth potential.

The chapter identifies four potential future scenarios. “Muddle through”—this scenario envisions a business-as-usual approach, though with a slight rebalancing of growth from the richest Americans to the middle classes. The United States will emerge as a major producer of both unconventional oil and gas, but carbon emissions are only reduced slowly. “Going for growth”—this scenario assumes a singular focus on growing the economy. Unconventional oil and shale gas are rapidly exploited and often exported. While domestic demand for coal falls, low-cost coal is sold to emerging markets, boosting emissions in other countries. Consumption is a key driver of economic growth, which is rapid but unevenly distributed. American resilience to risk is strengthened, but resources are used to react to, not manage, crises. “Intelligent design”—this scenario sees strong economic growth, but with a more deliberate attempt to guide trends and risks. Administrations focus on employment through investment in education and training, and innovative approaches to regulation. In the energy sector, new opportunities are maximized through policies supporting the potential of gas to reduce emissions

and some contribution from the energy sector to fiscal consolidation. And “Emergency response”—this scenario sees policy driven by a series of shocks, leading to a net negative economic impact. Other impacts are difficult to predict.

Having examined the current status of the American economy, the chapter identifies three main requirements for policies that will drive the United States toward the “intelligent design” scenario: (1) a future direction cannot rely too heavily on the federal government, (2) a new growth model is only likely to work if it generates wealth for all, and (3) policies will need to fulfill a vision of environmental sustainability based on greater resilience in the face of crisis and protection from immediate environmental impacts.

The U.S. has the opportunity to lead the international system on a number of issues, but American leadership needs to be underpinned by a robust economy. By addressing the key economic, environmental, and social challenges that the country faces, the economic base for American leadership should be strengthened.

Kevin Massy picks up on this theme in “Governance Challenges and the Role of the United States in the New Energy Landscape.” We asked Kevin to think through the central questions in the international governance of energy. And, wisely, rather than turning to an account of the various formal and informal institutions that have been forged to deal with energy questions, he turned instead to the single most consequential variable: how the United States seeks to shape global energy markets. He starts, as we do, by identifying insecurities and vulnerabilities—specifically, five factors that are likely to make market failures more common in the current energy landscape: a shifting macroeconomic landscape, the increasing prominence of new state-backed actors, the increasing technical and political complexity around energy production, the globalization of technology itself, and the externalized costs of greenhouse gas emissions. He notes that the United States finds itself in a unique position to address these challenges and to promote improved market function and overall energy governance.

The energy sector is witnessing a structural and permanent shift in global consumption and production patterns. Previously, trade in global energy took place within a framework of governance established by the Organization of Petroleum Exporting Countries (OPEC) and the International Energy Agency (IEA). Today, the growth in demand from emerging-market countries—particularly in Asia—coincides with a decline in demand among countries making up the Organization for Economic Cooperation and Development (OECD) owing to increased efficiency and stable or declining populations. Another factor changing the demand-supply landscape is the widespread commercialization of technology to produce “unconventional” oil and gas resources in the United States. The implications of the changing supply-demand landscape for energy governance are profound. Because China and India not full members of the OECD, and

therefore not represented in the IEA, the major drivers of demand are not part of the conversation. At the same time, the increasing dysfunction of OPEC is leading to reduced certainty with regard to production.

A direct consequence of the structural changes in the global energy market is a greater prominence of state-owned or state-controlled entities in the international energy sector, usually in the form of NOCs. The increasing prominence of state-controlled companies in energy development projects overseas presents several governance-related challenges. The first challenges address the NOCs' motivations—real and perceived—which are more likely to be seen as geopolitical instead of purely commercial. The displacement of international oil companies (IOCs) by NOCs also has implications for the stability of host countries, as NOCs are not bound by the same internationally monitored levels of operational and ethical transparency as are IOCs. The rise of NOCs also raises the possibility of complicated IOC-NOC relations and NOC–host country relations in places like the United States and Canada.

As the world's demand for oil and gas rises and production from traditional hydrocarbon regions declines, countries and companies are having to look to ever more complex and challenging frontiers for production. This push for new production opportunities comes with new technical hazards for which governance structures are absent or only partially in place. Frontier production can also combine both technical and political risk, for example, in the Arctic. New mechanisms are needed to ensure that the risks of frontier exploration and production are fully internalized. Failure to do so carries the risk of an accident that will have negative consequences for the environment and industry.

A related, but distinct, trend that is increasing the challenge of energy governance is the diffusion of energy technologies, such as civil nuclear power, to emerging and developing-market countries. The transmission of complex energy-related technologies to new markets offers significant opportunity as more countries harness advanced exploration, production, and consumption knowledge to meet demand. However, this diffusion comes with the risk that countries adopting new technologies will not absorb all the risks themselves but be content to let some of these risks flow to the broader international system. An additional governance challenge arising from the globalization of energy technology relates to the increasing interconnectedness of stakeholders and the increasing potential for widespread consequences from local events.

One of the largest market failures related to the energy sector has been the ongoing externalization of the climate-related costs associated with the burning of fossil fuels. In the absence of an overarching global mechanism for mitigating greenhouse gases, several innovative measures involving direct intervention in the Earth's biosphere or atmosphere are being considered to address global warming. While geoengineering projects (which can be divided into two major categories:

carbon dioxide reduction and solar radiation management) have traditionally been considered a “Plan B,” they are now gaining prominence as serious possibilities. While the merits of each of these measures as a means of reducing greenhouse gases is a matter of debate, the possible side effects or unintended consequences of their deployment throw up a stark set of governance challenges. At the time of writing, the United States has begun to carve out a leadership role on climate issues, but it remains to be seen how far, how deep, how sustained, and, most of all, how successful this effort will be.

Changing economic, technological, and environmental factors are likely to present significant new challenges for energy governance in the coming decade. The new energy landscape will pose technical as well as political governance challenges. Fortunately, for nearly all of the obstacles outlined above, one actor above others has the ability to shape the governance agenda positively for the new energy landscape: the United States, which has the prospect of being both the world’s biggest consumer and producer of oil. Using market mechanisms to correct market failures and acting to further its own economic and geopolitical interests, the United States could make meaningful progress on one of the most intractable governance challenges of the age.

The pivotal role of the United States is a conclusion also of *The Risk Pivot: Great Powers, International Security, and the Energy Revolution*. That book and this one are designed to be treated as companion volumes. *The New Politics of Strategic Resources* sets out the underlying political economy realities for several of the most consequential states and for some crosscutting global challenges like food and water. *The Risk Pivot* builds on that background and extrapolates from it the key dynamics that are likely to shape great-power tensions and those that seem certain to complicate globalization and climate change negotiations.

Both set out key choices that confront the top powers but first and foremost challenge the United States. This volume provides the deep context in which the United States must make its choices. It does not aim to be comprehensive—we could have added chapters on Indonesia and Turkey, on Venezuela and Pakistan, on Australia and Canada, and many others besides. But we hope that the selection of country studies and thematic issues discussed in the book illustrate the emerging global dynamics, without exhausting them—or the reader!