The last decade has unveiled a significant change in global energy markets, with crude oil, natural gas, coal, and electricity markets all in the midst of transition. Developments in the U.S. have served as a principal antagonist, with the shale revolution at the epicenter. In fact, shale’s impact on the global energy landscape has been so dramatic that the U.S. Department of State formally established the Bureau of Energy Resources in 2011 to manage three core objectives—energy diplomacy, energy transformation, and energy governance and access—which have been increasingly woven into the fabric of U.S. foreign policy. This stems from global recognition that the U.S. is now generally viewed as an “energy superpower.” Maintaining this position requires balancing energy development with domestic and global environmental objectives, foreign policy objectives, and goals for long-term robust economic growth. Indeed, sustainability requires such calculus be performed and reexamined on an ongoing basis, particularly as technology continues to alter the landscape. In fact, the role of technology and the position of the U.S. as an innovator have been central to the shale revolution and will remain vital to the U.S. maintaining its newly emerged status.

ENERGY IS VITAL FOR ECONOMIC GROWTH, BUT THE SOURCES OF GROWTH ARE CHANGING

Energy is intimately linked with economic activity, a fact borne out by the role the wealthiest and most economically diverse nations—the Organisation for Economic Co-operation and Development (OECD)—played in shaping global energy demand growth in the 20th century. According to the International Energy Agency (IEA), the OECD accounted for almost 60% of global energy demand in 1990, a position that had been relatively stable for decades prior. This becomes even more striking when one considers that the OECD accounted for only about 1.1 billion of the world’s 5.3 billion people in 1990. However, the two decades following 1990 brought significant change as the center of global economic activity shifted toward the developing non-OECD economies. Demographics are also shifting, as only 1.3 billion of the world’s 7.4 billion people currently live in the OECD. As a result, we are already witnessing a profound impact on patterns of energy demand growth. By 2010, the OECD’s share of global energy use had fallen to 42% and has continued to decline to about 39% currently. Thus, we see an emerging trend toward a future that is starkly different than the 20th century. Continued economic development in non-OECD nations will bring new energy demands from more than 6.1 billion people, over 1.1 billion of whom live in such abject poverty that they have no access to modern energy services—a condition referred to as “energy poverty.”

The prevalence of energy poverty is one of the least understood and perhaps most important factors that will define the future of global energy use. As wealthier regions of the world strive to reduce their environmental impact through new technologies and advanced digitalization,
such options may not always be readily available at an acceptable cost in poorer regions. Thus, both domestic and international policies as well as continued technological innovation will play critical roles in establishing the energy pathways poorer nations pursue as they strive to unburden themselves from poverty.

Looking ahead at the next two decades, it is difficult to project a future in which developing Asia is not a major driver of global energy markets. India, the ASEAN region, and China collectively account for 3 billion people, and the region promises to continue to be economically vibrant. Even at modest rates of economic growth across the region, over 400 million people will likely move into the middle class by 2030, which translates into significant energy demand growth, all while OECD demand continues to slow. Thus, future global energy markets will be driven by demands in the developing world. Given the unconventional energy resource potential in the Western Hemisphere—Canada, the U.S., Mexico, Venezuela, Brazil, and Argentina—the world is on the cusp of a shift in global energy trade that will redefine markets and geopolitical relationships. Policy in the U.S. and other OECD nations must come to grips with this impending paradigm shift relative to the status quo of the last century. This can present a challenge to achieving a sustainable future that balances economic growth, energy demand, and environmental objectives. Importantly, U.S.-led innovation is central to achieving these objectives while seeing the U.S. maintain its global status.

COMMERCIAL MOTIVATION VERSUS POLICY INCENTIVE: FUEL CHOICE AND THE ENVIRONMENT

Much of the recent environmental discourse has focused on transitioning to low-carbon energy. However, what’s “good for the goose may not be good for the gander.” For example, the last major build-out of coal-fired power-generation infrastructure in the U.S. was in the late 1970s/early 1980s. Thus, given their age, decisions to either retire or retrofit a large fraction of the U.S. coal-generation fleet are looming. Given the abundance of low-cost U.S. natural gas available to the electricity sector for use in highly efficient natural gas generators, coal will find it increasingly difficult to maintain market share. In sum, the transition away from coal in the U.S. is commercially motivated. The same does not hold true in China and India, where a large fraction of coal-consuming infrastructure is much younger, and early retirement would force an enormous stranded cost and economic burden. This paints a very different reality in the developed OECD economies from that in the developing world, and it highlights the importance of technology in dealing with environmental issues in a very heterogeneous global energy market.

To be sure, market forces will always act to promote the most efficient allocation of resources possible, and understanding this is vital to avoiding the “law of unintended consequences.” In the end, whether or not a policy intervention or regulatory measure is justified depends on the balance between the cost and benefit. The path that allows market mechanisms to determine the allocation of capital and penetration of new technologies with the fewest possible impediments will generally be the most successful. The energy challenge is one of significant scale and requires a long-term view if it is to be successfully addressed. Long-term goals can be sustainably achieved through fundamental research and development. This can be funded by modest taxes on energy development and use, which would encourage different behaviors by consumers and producers. So while a sustainable energy future requires clear and transparent regulation that promotes adequate capital investment to keep pace with aging infrastructure and the massive scale of the energy complex, long-term investments will be fueled by innovation. This means research and development is vital, and it carries significant public benefit.
SUGGESTED POLICY PATHWAYS: STABLE REGULATION, DEEPER INTEGRATION, AND TECHNOLOGY

Policies that more broadly address the future of energy while recognizing the global interconnectedness of energy markets are vital, and maintaining the position of U.S. leadership will require long–term thinking toward regulatory stability and innovation. As such, it is important that U.S. energy policy recognizes that oil, gas, and electricity markets are deeply integrated across Canada, the U.S., and Mexico. An integrated approach is important for ensuring energy security, and expansion of cross-border infrastructure will enhance trade and deepen the North American market. To ensure success, policy should create pathways for the market–oriented allocation of capital throughout the energy value chain so that market forces are the prime determinant of the future of the energy sector. Moreover, an emphasis on innovation will make new market outcomes both possible and sustainable.

Wide–scale reform of fiscal policy measures in the energy sector should also be considered. As one example, a modest tax on transportation fuels at the point of consumption would promote greater efficiency in end–use. This carries environmental benefits, but it also carries the important benefit of promoting greater resilience to future energy price movements. The associated tax revenues could be designated for infrastructure improvements and energy R&D. This, in turn, will create employment opportunities and encourage the expansion of human capital in the energy technology arena. More generally, both direct and indirect subsidization of energy resource development and energy technology deployment should be reconsidered across the energy landscape. Policy should consider a redirection toward funding basic R&D in energy technologies. Future breakthroughs can ultimately drive commercially successful technology deployment, which will have spillover effects that benefit long–term environmental and energy security goals and ensure a continued leadership role for the U.S.

To this end, the new reality of U.S. energy must be woven into foreign policy and international trade negotiations while recognizing that global energy markets are becoming ever more integrated. This requires an expanded and permanent energy focus at the U.S. Department of State that is coordinated across Cabinets. This will include deepening relations with countries in the Middle East, where stability remains very important, and countries in Latin America and Africa, where private capital investment is desperately needed. Finally, the U.S. should take a leadership role in addressing energy poverty.

For success to be forthcoming, environmental concerns related to energy production and use must be confronted. For example, the federal government could work with states to establish baseline regulatory guidance for water use and disposal, with an emphasis on deploying new technologies. Another example involves streamlining infrastructure permitting so that it is not used as a de facto mechanism for addressing environmental issues. Prolonged delays in infrastructure investment can result in price spikes and broad negative economic and welfare consequences. With regard to methane emissions, policy could facilitate the use of currently available technologies, such as drones, for real–time monitoring so that “super–emitters” can be more readily identified and remediated. In addressing climate change, it is important to also consider greenhouse gases (GHGs) other than CO2, particularly those with significantly greater impact such as methane (CH4) and nitrous oxide (N2O). Doing so could yield benefits by inviting a greater array of technologies targeting a broader array of GHGs to provide real solutions.

To conclude, energy and environmental policy should not be based on OECD–centric objectives. Rather, a broader approach is important to ensuring long–term engagement from the developing world and, ultimately, successful long–term outcomes in the energy and environmental policy arena.

This policy brief is part of a series of recommendations from the Baker Institute for the incoming president’s administration.

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