

Report on  
Energy Geopolitics: Challenges and  
Opportunities



International Security Advisory Board

July 2, 2014

## **Disclaimer**

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While all ISAB members have approved this report and its recommendations, and agree they merit consideration by policy-makers, some members do not subscribe to the particular wording on every point.



**United States Department of State**

*Washington, D.C. 20520*

July 2, 2014

**MEMORANDUM FOR UNDER SECRETARY GOTTEMOELLER**

**SUBJECT: Final Report of the International Security Advisory Board (ISAB) on Energy Geopolitics – Challenges and Opportunities**

I am forwarding herewith the ISAB's report on Energy Geopolitics. The report responds to your request of July 17, 2013, that the Board undertake a study on changing global energy geopolitics and related international security challenges and opportunities. The report was drafted by members of a Study Group chaired by Dr. David Kay. It was reviewed by all ISAB members and unanimously approved by July 1, 2014.

The Board undertook a strategic-level review of trends arising from expected changes in energy markets rather than a detailed evaluation of Department programs. The report describes emerging changes in global energy, provides background on the domestic market and policy context, and reviews of selected energy and related geopolitical developments by region.

The report recommends ways to approach energy more strategically within and beyond the Department, accurately characterize U.S. production growth to support informed policymaking and better diplomatic messaging, address specific regional energy security concerns, and adapt to the geopolitical challenges posed by rapid emerging market demand growth. The report finds that one of the most significant long-term security challenges posed by energy is climate change, and that addressing its risks demands far-reaching reforms to the energy sector.

We encourage you to consider the report's findings and recommendations carefully. The Board stands ready to brief you and other members of the Administration on the report.

A handwritten signature in black ink that reads "GARY HART". The signature is written in a cursive, slightly slanted style.

Hon. Gary Hart

Chairman

International Security Advisory Board

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# INTERNATIONAL SECURITY ADVISORY BOARD

## Report on Energy Geopolitics: Challenges and Opportunities

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## Executive Summary

***The crisis in Ukraine is the latest reminder of how energy permeates the geopolitical landscape and is a fundamental element of national power.*** It can be a source of political leverage or vulnerability for individual countries, and can promote economic prosperity or instability. Beyond the evolving energy relationship between Russia and its neighbors, which demands major changes in European policies, ongoing shifts in markets demonstrate that energy has again become one of the most strategic and influential determinants of U.S. engagement with the outside world. One is the radical – and surprising – increase in U.S. production of oil and gas, which changes the country’s position in global energy markets more profoundly than at any other time in decades. But its policy implications are poorly understood, and the future trajectories of that production growth are highly uncertain. Other, arguably more enduring developments are the rapid growth of Asian demand for fossil fuels, especially in China and India, and energy’s ties to climate change concerns. These and other energy issues comprise a complex confluence of domestic and international interests and policies. The private sector must be engaged to adequately address them, while energy must be elevated significantly in national security strategy, strategic analysis, and policymaking within the Department and the federal government as a whole.

***U.S. energy independence is a myth.*** Since the 1970s, successive administrations have described energy independence as a desirable policy goal, or a plausible market reality. It is neither. Emerging market trends will not make the United States truly self-reliant in energy – physical trade will continue, and political and economic ties always limit any country’s isolation from energy developments in the rest of the world. Even if oil and gas production growth enables the United States to supply more of its own energy needs, global market and geopolitical trends will affect U.S. prices and the economies of our trading partners. From a foreign policy perspective, misguided speculation that the United States could become energy independent feeds misperceptions around the world that the United States might disengage from global energy markets and related political or military commitments. Domestically and internationally, the United States should emphasize shared energy security in the context of interdependent energy markets.

***Rising U.S. oil production does not alone justify a change in the country’s relationship with the Middle East.*** The United States continues to import oil from the Middle East, even if in smaller amounts than other major countries, and the United States has an enduring interest in the free flow of energy to its allies and trading partners. The Middle East will continue to play an especially pivotal role

in oil markets – and influence the prices U.S. consumers pay – because of its production volumes, spare capacity, low supply costs, and perceived uncertainties about freedom of transit for the large volumes flowing through the Strait of Hormuz. The United States also has enduring interests beyond oil in the Middle East. Energy trends will tighten geopolitical ties between the Middle East and Asia, impacting Western interests and requiring adaptation by the United States. But other countries should rest assured that changing energy trends will not in and of themselves cause reduced U.S. commitments in the Middle East and beyond.

***The U.S. oil and gas revolution is remarkable. But the rise of emerging market demand for fossil fuels, especially in Asia, is arguably the more geopolitically significant energy development.*** On the one hand, U.S. oil and gas production growth has important economic benefits and contributes to stable, well-supplied energy markets as the United States now imports less and exports more. However, shifting domestic energy trends are not expected to fundamentally transform the world's long-term energy outlook, nor will they diminish U.S. interests in open global markets or how other countries meet their energy needs. U.S. production growth is largely a private-sector success story, and its oft-touted national security benefits are unclear. On the other hand, rapid demand growth in China, India, and other emerging markets significantly alters fuel mixes and trade flows. It also challenges energy security frameworks and climate change mitigation efforts heretofore structured mainly around the industrialized West. It is this shift in demand growth that will present the geopolitically larger energy challenge for U.S. international economic and national security policy in the coming decades.

***Over the long-term, the greatest national security challenge posed by energy is climate change.*** Expected fossil-fuel consumption trends would make it impossible to meet stated climate change mitigation goals. A growing body of scientific literature asserts in increasingly clear terms that climate change, the primary causes of which are inextricably tied to energy, is poised to threaten every nation on the planet. Ambitious and potentially costly energy policies, which no government has yet demonstrated the resolve to enact, will be required to address the challenge and mitigate risks. No single country can on its own take the steps necessary to limit change, much less reverse its deleterious effects, while international negotiations struggle under the weight of myriad interests. The United States and China, as well as India and European states, are so fundamental to current and future emissions levels that they must share the burden of leadership – and potential for short-term economic pain – to address seriously the energy drivers of rising greenhouse gas emissions. A price on carbon would be the most efficient market approach.

## **Introduction: Emerging Changes in Global Energy**

For the past 40 years, U.S. policymakers have tended to view energy – especially oil – as a source of vulnerability. U.S. attitudes and policies were constructed around perceptions of domestic scarcity and insecurity. This paradigm is changing.

Structural changes in the market provide the most obvious basis for reassessing energy geopolitics. Market trends are causing countries to assume new roles in the production, consumption, and trade of energy. The United States is leading the way. It has accessed new oil and gas resources, with dramatic implications for its production and the trade balance. Meanwhile, the geographic center of global energy demand has moved from West to East. Oil demand in advanced economies is in a slow structural decline, while developing economies now dominate energy consumption growth.

If market changes are one reason to examine the changing relationship between energy and national security, market failures are another. Energy was once deemed secure when fuels were physically available at a reasonable price. However, environmental threats, including climate change, are increasingly changing the energy equation. To safeguard broader national security interests, energy use must also be sustainable – not just in terms of available supplies for the future, but also in terms of the increasing impact this use is having on the global environment. Each country prioritizes and addresses the triple imperatives of energy security – access, affordability, and sustainability – in different ways. While policy debates often tend to focus on the supply side, greater energy efficiency and conservation can reduce consumption and improve all three measures of energy security.

Technical innovations – first widely applied to shale gas, and then to oil – have revolutionized the U.S. energy outlook. The United States is now the world's fastest growing oil producer, achieving what would have been unimaginable just a few years ago. The global energy investment climate is also shifting. Shale plays are prolific but require continual investment due to rapid decline rates from individual wells. Companies are increasingly investing scarce capital in relatively low-risk, high-reward U.S. shale prospects with short-term payoffs, as opposed to other countries that may have even more oil and gas potential but greater operational barriers. The U.S. example contrasts with investments where conventional projects may be more geologically uncertain, can take years to develop, or will occur in less politically stable or investment-friendly places.

Countries around the world are exploring their shale resource potential to determine if they can create their own versions of the U.S. oil and gas revolution.

Although imports have fallen, the United States remains a large consumer in a global market. The United States will continue to pay global prices and be a net importer of oil for the foreseeable future, albeit at a lower level, and the economic and security benefits of its production growth must be viewed from that perspective. Traditional suppliers, including Middle East members of the Organization of the Petroleum Exporting Countries (OPEC), continue to command large market shares. Oil prices persist at historically high levels despite the growth in U.S. production. However, that growth has stabilized the market and limited oil price volatility. Since 2011, and especially over the last year, U.S. production growth has eased adaptation to large volumes of supply disruptions around the world.

Unlike the globally integrated oil market, natural gas markets are segmented due to limited pipeline connections and high transportation costs for globally-traded liquefied natural gas (LNG). Natural gas markets are becoming gradually more flexible due to increasingly diverse supply options, relatively faster growth in LNG as opposed to pipeline-traded volumes, and more efficient markets. Reduced U.S. imports due to the shale revolution have allowed LNG once intended for the United States to flow elsewhere. Yet recent events in Ukraine highlight the continued dependence of other countries on traditional sources of supply, such as Russia, in this case with serious negative implications for national and regional security. Natural gas prices in Europe and Asia have been up to three to five times higher than they are in the United States, providing an economic rationale to consider LNG exports.

Emerging markets, expected to be responsible for most of the growth in total energy demand over the next few decades, are changing energy trade patterns. China will drive demand growth over the next decade, according to International Energy Agency projections. India could lead thereafter in terms of growth rates, though China will remain the largest energy consumer in terms of overall levels. An increasing share of Middle East oil is destined for Asia – including well over three-quarters of the oil transiting the Strait of Hormuz – with attendant impacts on relations among both supplier and importing nations, affecting in basic ways the geopolitics and geoeconomics of the region and beyond. The Middle East, Latin America, and Africa will be other strong sources of energy demand growth.

Emerging market demand growth creates several policy challenges and opportunities. For example, continued fossil fuel subsidies in some developing markets elevate consumption, exacerbate environmental problems, stress national budgets, and could be a growing source of political unrest as governments try to rein in their fiscal costs. The United States has a role to play in encouraging market-based energy pricing, but it must navigate significant political obstacles to reform where subsidies are viewed as basic tenets of the social contract.

Decades ago, the industrialized members of the Organisation for Economic Co-operation and Development (OECD) implemented multilateral and national policies to promote resilience if consumers are confronted with adverse market conditions or the coercive use of energy by other countries. In particular, strategic oil reserves were developed to respond to market disruptions. Given demand growth outside of the OECD, there is a major need for the United States and other OECD members to modernize this international energy architecture and encourage major developing countries to adopt similarly effective energy security strategies. There will also be a need to factor this demand growth into basic security and strategic approaches and policies, especially in the region that embraces the Middle East and Central Asia.

The uneven distribution of energy resources could open new areas to energy development and affect political stability in both exporting and importing regions. For example, some African countries will emerge as a new generation of energy producers, the revenues from which could change the political behavior and military capabilities of domestic regimes and opposition groups. Relations between and among states will change and in some cases could strengthen, if economic interdependence fosters more robust ties, or be threatened, if energy becomes a “prize” to be won in domestic or international conflicts. Economically, physically, and environmentally sound development of energy sectors will depend on resolving political constraints, corruption concerns, and governance issues. The race for large trans-boundary resources, such as in the Arctic, will very likely become more intense as technology and environmental conditions evolve to make them more accessible.

Given the pace of U.S. oil and gas production growth, as well as other significant shifts in energy markets, it is easy to forget the extent to which the global energy mix has stayed the same. The major sources of energy used to fuel the global economy are expected to be relatively stable over the foreseeable future. Fossil fuels – coal, oil, natural gas – are dominant, accounting for around 80 percent of total energy supplied. Coal is often treated as the forgotten fuel, in part due to its

physical abundance, but it continues to meet a large share of U.S. electricity demand as well as the rapid growth of energy demand in Asia. At the same time, it plays a greater role in climate change than any other energy source. Nuclear energy is an important source of baseload power in many countries and is expected to grow considerably in China, India, and other individual markets, but it will still meet only a moderate share of overall global energy demand. Renewables are among the fastest growing sources of energy supply, but their total market penetration is likely to remain small under present policies and technological rates of change. Even if renewables are now better able to compete with fossil fuels when new capacity is being developed, replacing existing fossil-fuel infrastructure represents a more difficult competitive challenge.

Projected levels of fossil fuel consumption will drive significant growth in greenhouse gas emissions and impose increasing costs, both with regards to climate change mitigation and adaptation. Recent reports by the Intergovernmental Panel on Climate Change and the National Climate Assessment underscore the extent of the problem and the inadequacy of existing responses. The mere growth of renewable energy and minor shifts in fuel use or energy efficiency will not avert this challenge – only dramatic changes to the energy system would. U.S. hydrocarbon production improves some elements of energy security, but should not distract from the need to more fundamentally reform the energy system to address other priorities like climate change.

Uncertainties in energy forecasts translate to uncertainty about future geopolitical developments, and whether or how current realities or “wild cards” in the energy future should affect policy. Forecasts inevitably look at the world through the lens of recent energy revolutions; it is more difficult to anticipate future ones. Disruptive technologies, economic developments, policies, natural or manmade disasters, and environmental concerns – or responses to them – can alter the expected paths of energy supply or demand. Nevertheless, broad predictions about overall physical energy trends over the next 10-20 years appear fairly robust. Energy prices, by contrast, are more difficult to predict and their trajectories can shape the budgets and behavior of other countries in more unexpected ways.

## **Energy Geopolitics: Challenges and Opportunities**

### *United States: The Domestic Context*

Traditionally, most energy security concerns in the United States have revolved around oil due to significant exposure to imports, the fuel's military and economic importance, and limited substitutability in some sectors of the economy, such as transportation. Tight oil – embedded in shale and other relatively impermeable rock – has been unlocked in North Dakota, Texas, and elsewhere by technical innovations like 3-D seismic analysis, horizontal drilling, and hydraulic fracturing. U.S. oil production has grown at record rates while net imports are down to multi-decade lows, prompting a reassessment of U.S. energy security strategies.

U.S. crude oil and total liquids production is expected to increase further in the future, but differing projections provide an uneven foundation for policy changes. The United States may be the world's largest producer of total liquid fuels, but it is unlikely to be a net exporter of oil in the coming decades. The United States will still import crude and be exposed to international oil prices whether or not it becomes a net exporter of total liquids.

Net imports now satisfy about 30 percent of U.S. oil consumption needs, compared to as much as 60 percent last decade. The decline in crude and refined product imports and increase in product exports have mitigated oil's contribution to the U.S. trade deficit. Lower consumption and greater efficiency, as well as production growth, are drivers of the trend. The United States is now a large net exporter of refined products, largely to Latin America and Europe, but trade in both directions will continue.

The United States remains the world's largest gross importer of crude oil, though China has passed it in terms of net imports of total oil. Given the characteristics of domestic crude production and refinery configurations, U.S. crude imports are increasingly heavy and sour (e.g., from Canada, Mexico, Venezuela, parts of the Middle East). Meanwhile, light, sweet imports (e.g., from West Africa, North Africa, the North Sea) are being displaced by tight oil production growth that has similar qualities.

Crude exports are restricted by law, while the Jones Act increases the cost of shipping oil by tanker within the United States. Regional discrepancies between light, sweet crude supply and refinery demand cause localized crude price discounts in the Midwest and Gulf Coast, which generally do not translate to lower refined product prices for consumers. The pressure to reform export regimes and

other policies could mount if domestic crude prices diverge significantly from international levels.

The evolution in U.S. markets during the last decade was similarly rapid for natural gas as for oil, and in some ways even more transformative in terms of domestic prices and trade postures. Explosive growth from shale basins began in the Barnett play in Texas around 2008. The application of increasingly effective hydraulic fracturing and horizontal drilling techniques were then applied to tight oil formations and shale gas plays in other parts of the country, such as the Marcellus in the Northeast. The changing domestic energy map has preceded pipelines and strained supporting infrastructure in some areas, while engendering political opposition where communities are unaccustomed to and uncomfortable with oil and gas development.

Earlier forecasts that the United States would become an increasingly large importer of LNG have proven incorrect due to the unexpected boom in shale gas production. The United States is still a net natural gas importer, mostly by pipeline from Canada, but that is projected to change over the next five years. LNG once destined for the United States has been redirected to other regions. Consequently, growing U.S. natural gas production has increased market liquidity and global supply even if the United States is not yet exporting large quantities of LNG. The amount of LNG the United States exports itself will depend on a regulatory review process and the commercial feasibility of proposed liquefaction terminals. U.S. natural gas production growth slowed over the past two years, in part due to depressed domestic prices.

Renewables have penetrated the electricity sector and transportation, in the form of biofuels, due to subsidies, other policy supports, and cost reductions. Wind and solar are among the fastest growing sources of electricity, but are growing from a relatively small base and capacity additions pale in comparison to existing levels of fossil-fuel generation. Fuel ethanol has grown to roughly 10 percent of the gasoline pool. Renewables are unlikely to displace enough oil and other fossil fuels to change the basic energy security equation absent disruptive technological developments, such as potential advancements in energy storage, or more ambitious environmental policies.

U.S. energy security is often described as a unified concept, but can differ for the military as opposed to the general economy. Physical supply chains matter in the event of war, which is inconsistent with normal assumptions about fungible global oil markets. The military also has limited ability to substitute away from specific

operational fuels. Recent trends could cause a divergence in how the Department of Defense and the country view energy security because domestic oil and gas production growth has few direct benefits for the former. The military will continue to rely on oil and purchase it close to the theater (60% of its fuel is purchased and consumed overseas), while its weapons systems are increasingly energy-intensive (unlike the U.S. economy, which is becoming more energy-efficient).

The U.S. oil and gas boom has been largely a private-sector success story. However, existing infrastructure (regulatory, market, and physical), government support, and the unique U.S. operating environment made possible what individual entrepreneurship made a reality. Private-sector benefits and public-sector interests must also be distinguished in principle and in practice. The U.S. is a market-oriented economy, not a mercantilist one. How energy markets develop is most often determined by the private sector, not the public sector, affecting how the U.S. government can “use” energy as a tool of foreign policy leverage.

### *Americas*

The Western Hemisphere is the current center of gravity for non-OPEC oil supply growth. It is one of the few regions to fundamentally change its energy trade patterns, in large part due to the domestic developments in the United States. As a result, the region is becoming less of a supplicant in the energy arena, and instead is increasingly a reliable supplier of energy to the world. A significant share of U.S. energy trade occurs within the Western Hemisphere, which is the source of most U.S. crude oil imports and the destination for most U.S. refined product exports.

Canada is by far the largest supplier of foreign energy, including oil, to the United States. U.S.-Canadian natural gas, oil, and electricity markets are tightly integrated. Canada is an important part of U.S. energy security, and the country now depends on the United States as an export market. Several proposed infrastructural projects could enable Canada to export greater volumes of oil and natural gas directly to global markets. Most projections anticipate the oil sands will be a large and sustained source of non-OPEC production growth over the next thirty years, but the costs of producing and bringing that oil to market are relatively high.

Mexico continues to be another primary source of heavy oil for U.S. refineries, despite the general decline in its production over the last decade. The steps Mexico has taken recently to pass nascent energy reform are significant, and could

positively affect its investment climate and growth prospects. Obstacles to implementation of these reforms remain. Even if full reform is achieved, it will take many years to materially change the country's energy trends.

Brazilian oil production is expected to grow considerably as it exploits its offshore pre-salt resources. If it meets expectations, Brazil would join the United States and Canada as a third key source of non-OPEC supply growth in the Western Hemisphere. Thus far, however, local content requirements, investment barriers, and technical challenges have caused Brazil to miss production growth targets.

Venezuela is the Hemisphere's other large oil producer, and by far its most politically unstable. Venezuela acts as a hawk within OPEC, pushing other members to restrict production even as it produces as much as possible – after all, it needs high oil prices to balance its budget and has difficulty increasing production regardless of OPEC targets. Mismanagement of the oil sector has caused Venezuelan oil production to stagnate well below what its massive resource base could support, while mismanagement of oil revenues and heavy subsidization of petroleum products and other goods has wreaked havoc on the economy. Domestic unrest in Venezuela could have potential regional consequences and poses a serious disruption risk to oil markets.

The current regime in Venezuela has used oil wealth to engage in petro-diplomacy. Through PetroCaribe and other similar arrangements, Venezuela effectively subsidizes oil shipments and provides various forms of financial aid to regional member states. A weakening of Venezuela's petro-diplomacy could represent both a challenge and an opportunity for the United States. Without continued Venezuelan financial assistance, the country's anti-American diplomatic agenda may fall on increasingly deaf ears. At the same time, countries highly dependent on PetroCaribe could be economically and politically destabilized if supports disappear.

Ecuador joins Venezuela as the other OPEC member in South America, though its production volumes are much lower. It shares another noteworthy characteristic with Venezuela: growing energy ties with China. Both countries must deliver an increasing volume of oil to Chinese companies to service debts secured through China's "oil-for-loan" strategy, as opposed to exporting it to generate "new" revenues. Much of the oil is resold by Chinese companies on the open market and, from a global market perspective, increased oil exports to meet growing Chinese demand are necessary and should not be perceived as a threat to U.S. energy and

national security interests. Still, tighter bilateral ties between China and regional states could have subtler diplomatic, political, and economic effects.

Colombia has made gains in the security of its oil sector – it now produces 1 million barrels per day – but its energy infrastructure remains vulnerable to attack should the peace process with rebels fail. Other South America countries may be less important from a global energy market perspective, but energy affects acutely their domestic politics or regional diplomacy. For example, energy is a potent political issue in Bolivia – plans to export natural gas to neighboring states and reform fossil fuel subsidies have led to civil unrest and even the toppling of some governments, while an uneven geographic distribution of resources within Bolivia underpinned autonomy movements.

### *Europe and Eurasia*

Recent events in Ukraine serve as a timely reminder of the role Russian energy plays in European geopolitics. The causes of the Crimea crisis and moves against eastern Ukraine are complex and beyond the scope of this paper. But energy has helped create the conditions for political and economic turmoil in Ukraine, and helped to shape potential risks and responses across the region.

Russia provides about one-third of Europe's natural gas supplies, though averages mask much higher levels of dependence for Baltic states and countries in eastern and southern Europe. Half of that gas transits Ukraine.

Ukraine itself relies on Russia for roughly half of its natural gas. Beyond the large volumes at stake, price is an important element of how Russia exerts energy leverage. Russia has applied or removed natural gas price discounts for political ends – including in the recent crisis, when former President Yanukovich accepted a Russian financial assistance package after abandoning plans for closer ties with the European Union. At the same time, extreme energy subsidies reduce the Ukrainian government's solvency and make it more difficult for the country to pay its energy bills. As a result, Ukraine is dependent on external assistance, while its arrears give Russia a commercial pretext for political decisions to increase prices, reduce flows, or make other demands on the country.

Further downstream, European states are perceived to be constrained in their ability to react strongly to Russian aggression due to dependence on imports from Russia and through Ukraine. This constraint is enhanced by Western private-sector investments in Russian energy. At the same time, dependence flows in both directions. Russia's natural gas trade relationships with its closest neighbors, such

as Ukraine, obviously transcend the strictly commercial, but its willingness to cut flows or use natural gas as a weapon against European trading partners further west should not be overestimated. An overtly political use of natural gas in the broader European natural gas market would over time risk Russia's revenue stream, further damage its reputation as a supplier, and create added incentives for European importers to seek alternatives to lessen dependence on Russian supplies. Europe is responsible for an estimated 90% of Russia's gas revenues, and there are few short-term alternatives to those exports.

As similar crises did – briefly – in 2006 and 2009, developments in Ukraine should shake Europe from any sense of complacency about energy. Supply-demand trends do not bode well; without significant shifts in energy patterns and major efforts by consuming countries, Europe will almost certainly import more rather than less energy in the coming years.

A lack of coordination in some European energy policies undermines European abilities to negotiate with Russia on a level playing field, much less from a position of strength. The European Union's Third Energy Package reforms represented a significant step forward. Reverse flow pipelines, natural gas storage, and other physical and market infrastructure make Europe more resilient in the face of supply interruptions. The European Commission's release of the European Energy Security Strategy in May, which is a response to regional concerns arising from the Russia-Ukraine crisis as well as longer-term trends, is a welcome signal of heightened European resolve to cut EU dependence on natural gas imports, integrate the market, and develop plans for supply disruptions.

Russian gas is too plentiful and too cheap to disappear from the European landscape. There is no panacea or set of easy short-term solutions. But with concerted effort, over time, Europe could greatly reduce its dependence on Russia. Encouraging such a secular shift through development of pipelines, LNG imports, unconventional and alternative gas supplies, renewables, and nuclear should be a top U.S. priority.

Even without the current crisis over Russia and Ukraine, the diversification of European energy sources and supply routes is a longstanding priority of U.S. energy diplomacy. Russia has pursued new export infrastructure, such as Nord Stream, to build redundancy into its European export routes by circumventing individual transit states like Ukraine. But Europe's need to enhance the security and diversity of supply sources beyond Russia remains unmet, and littoral Caspian Sea states like Azerbaijan, Turkmenistan, and Kazakhstan can be part of the

solution. Direct access to Caspian natural gas through the southern corridor, including the Trans-Anatolian and Trans Adriatic pipelines, is one possibility. A lasting détente between Iran and the West could eventually lead to support for the construction of pipelines from and through Iran, long sought by some energy companies, and give Europe access to large conventional gas reserves capable of competing directly with Russia. The flow of hydrocarbons from Central Asia and the Caspian Sea region will be important in any event, with both geopolitical and geoeconomic implications.

One source of supply that could displace some Russian imports is European production, particularly of shale gas, which some countries like the United Kingdom and Poland are pursuing seriously. Changed attitudes about unconventional gas development could alter, over the longer term, the production outlook and economically challenge Russian gas. But this will be more easily said than done given technical challenges, needed market reforms, and local opposition in some countries to hydraulic fracturing. It will also take considerable time before significant shale gas supplies come online in Europe, limiting their relevance for near-term crises like the situation in Ukraine.

Growing availability of LNG has given Europe greater leverage in negotiations with Russia. LNG alone is likely to be too scarce and too expensive to alone undermine Russia's position in the European market. But a larger and more flexible spot market for LNG would make the natural gas market more adaptable to localized disruptions.

Most focus on Russia relates to its role as the largest natural gas exporter, making it easy to forget that it is also one of the world's two largest producers of crude oil. Observers have noted that oil is the more important commodity for Russia's purse, while natural gas is more important for Russia's political leverage. High oil prices, like experienced today, weaken pressures for structural reform in Russia and some academics assert Russia acts more aggressively abroad when its budget is flush with resource revenues.

Russia is also pivoting gradually to the east, a trend that could accelerate depending in part on how the overall political, economic, and strategic relationship with Europe and the United States develops. Russia already exports increasingly significant volumes of oil to Asia, and has also publicly discussed the possibility of a large oil bartering deal with Iran. Russia is developing LNG terminals in Sakhalin and Vladivostok in the east, as well as Yamal in the north.

Russia and China recently concluded longstanding negotiations to trade natural gas. The \$400 billion, 30-year agreement calls for 38 billion cubic meters of gas from East Siberia to be shipped via pipeline, pending major investments in infrastructure by both countries. The deal reflects the needs of major energy producers and consumers to link supply with demand and is not a surprising development or, on its own, inherently detrimental to U.S. interests. While the deal was announced in the context of heightened tensions between Russia and the West, it is not anticipated to divert supplies from Europe. It will take until the end of the decade or beyond before peak volumes are shipped, which will still be a fraction of Russia's natural gas trade with Europe. Terms and conditions of the contract were not publicly disclosed, but indications are that Russia had to compromise greatly on the price charged to China.

Other European energy policies and market conditions factor into broader economic and geopolitical forces. For example, Germany's decision to embark on an early shutdown of its nuclear power plants will increase reliance on a combination of renewables, carbon-intensive coal (including imports from the United States), and/or imported natural gas. The natural gas price disparity – Europe typically pays around three times more than U.S. consumers – is one driver of European competitiveness concerns.

The Arctic holds one of the world's great stores of untapped oil and gas resources and could serve as an increasingly significant trade route as the climate changes. Circumpolar states in Europe, Eurasia, and the Americas could take extremely divergent approaches to economics and security in the cold waters to the north. New energy investment and production opportunities in the lower-48 may diminish U.S. private sector interest in Arctic energy ventures. In contrast, Russia has been assertive about its Arctic presence. The environmental risks and potential commercial rewards of energy exploration are both great. Energy could affect the deployment of national assets or create regional tensions, and the Arctic is one place where NATO and Russian territorial claims abut each other. Beyond the natural economic competition, it is also an area where there should be political incentives for cooperation, as already takes place in the Arctic Council.

### *Middle East*

The Middle East's importance to meeting global energy demand endures, despite U.S. production growth. Middle East production growth over the coming decades is essential to meeting Asian oil demand, and that fact alone will have major geopolitical implications. The Middle East is also emerging as a larger source of oil demand, in part due to high fossil fuel subsidies, which could limit the amount

producers are able to export in the future unless consumption growth rates abate. Beyond oil, Qatar is the world's largest exporter of LNG, but natural gas is underutilized in most regional states.

Saudi Arabia remains singularly important to oil markets due to its production volumes and spare capacity. It is one of the world's two largest crude oil producers (along with Russia) and the largest oil exporter. Saudi Arabia also plays a significant role in stabilizing the market because it continues to have and exercise a substantial ability to adjust its production levels in response to market conditions. Along with inventories, spare capacity acts as a form of insurance for a market that would otherwise balance supply shocks through much higher prices. The United States held spare capacity until the 1970s due to restrictions on production imposed by the Texas Railroad Commission. Some posit that U.S. tight oil, which can be brought online relatively quickly, can within limits stabilize prices and act as de facto spare capacity. But for now, Saudi Arabia is the only country to have invested in maintaining significant volumes of spare capacity, with much smaller levels spare capacity occasionally held by the United Arab Emirates and Kuwait.

The market influence often attributed to OPEC should primarily be ascribed to Saudi Arabia. OPEC rarely acts as a true cartel. It is little more than the sum of its parts – individual member states are independently significant oil market actors, but the organization is ineffective at enforcing production targets. Saudi Arabia has been the only member to regularly restrict supply to affect oil prices and market balances. Growing U.S. and other non-OPEC oil production reduces the “call” on OPEC, or the amount that OPEC member states need to produce to meet demand. Given market trends, members may need to make politically difficult production decisions or possibly accept lower prices depending on the rate at which global demand rises, especially on the part of Asian countries. The organization's cohesiveness could be weakened over the short-term, if non-OPEC production growth continues to outpace demand growth, or over the long-term, if growing volumes from Iraq or Iran challenge Saudi Arabia's dominance.

The memories – many of them false – of the 1973 Arab oil embargo still resonate and affect strategic thinking about oil and the Middle East, usually in unproductive ways. Actions by some OPEC members to raise posted prices and restrict production undoubtedly affected the market, but the Arab oil embargo itself was largely ineffective in achieving its stated objectives because flows from other countries could be redirected. The gas lines in the United States arose not because of an absolute physical shortage of oil, but because price controls and other policies in the United States prevented supply and demand from rebalancing at a

higher price. Many of the market and policy conditions that led to the 1973 oil crisis no longer exist, but unfortunately that experience is still used to draw mistaken conclusions about how U.S. imports of Middle East oil affect energy security.

Other regional energy security perceptions relate to the Strait of Hormuz due to the volume of oil transiting it and its disruption risks. A tangible expression of the U.S. commitment to the Middle East is the Fifth Fleet, which provides reassurance regarding the protection of sea lines of communication through the relatively narrow strait. Approximately 17 million barrels per day of oil flow through the Strait of Hormuz, roughly 20 percent of the total volume of oil traded worldwide. Unlike other major chokepoints, closure of the Strait of Hormuz would shut in much of the oil flowing through it, due to a lack of sufficient alternative pipeline routes to get oil to market.

In the unlikely event that it would occur, a complete and sustained disruption to oil flowing through the Strait would cause oil prices and shipping insurance rates to rise to unprecedented levels and impose an extremely severe shock on the global economy. The likelihood that Iran would act to close the Strait in response to heightened tensions is low, because Iran itself relies on trade through it, and preemptive attempts to block it could provoke military action. Any potential actions Iran could take are more useful as a deterrent or would likely only come in the event of war. The U.S. Navy is also prepared to take steps necessary to reopen the Strait. Nonetheless, perceptions of Middle East conflict risks are often manifested in the price of oil, through traders' changing and questionable assessments of the probability the Strait might be disrupted.

The robust enforcement of sanctions against Iran illustrates how, up to a point, oil can be used as a diplomatic tool in broader strategic battles. Consuming countries have used boycotts, insurance regulations, and financial market mechanisms to pressure the Iranian government by restricting its oil exports, counterbalancing the traditional conception of the producers' "oil weapon." As an increasing share of oil demand and imports shift to Asia, creating and enforcing similar sanctions regimes will require cooperation with a larger and more diverse set of countries.

As of the time of writing, it is not yet clear whether sanctions will ultimately be effective in helping to convince Iran to address the international community's concerns about its nuclear program. However, the sanctions clearly have had a major impact on the Iranian economy, affected Iran's approach to negotiations, and been a factor in recent diplomatic progress. U.S. and other non-OPEC production

growth have indirectly added to the viability and enforceability of sanctions by allowing the market to accommodate, without dramatic price spikes, the loss of some Iranian oil.

A negotiated settlement over Iran's nuclear program would change global oil market dynamics. Over the short-term, prices could fall if sanctions on the marketing of Iran's oil were lifted and Iran were able to restore production to pre-2011 levels. Over the long-term, oil balances would change if international investors were able to access and harness Iran's oil and natural gas potential. A rapprochement with Iran could also have subtler influences on the market by reducing perceived geopolitical risks related to the Strait of Hormuz that may add a "risk premium" to oil prices and insurance rates. At the same time, Sunni states on the Arabian Peninsula could feel threatened if Iraq and especially Iran become epicenters for new energy investments, and these investments become elements in what increasingly seems likely to emerge as a Sunni-Shia "civil war" in the region. This "civil war" – at the moment most evident in Syria and Iraq – has major geopolitical dimensions, including the competition for primacy among regional countries that are also significant fossil fuel producers.

Iraq is a crucial source of supply to meet global demand growth. The IEA expects Iraq to account for 60 percent of the growth in OPEC capacity through the end of this decade. While Iraqi production potential is massive, above-ground risks to the sector are similarly large, as witnessed by the brutal offensive being waged against the government by the Islamic State of Iraq and the Levant (ISIL). Significant oil disruptions or project delays, whether technical or security-related, would affect current market conditions as well as the market's ability to meet future oil demand growth at expected price levels.

Most Iraqi oil is produced in the south. ISIL is unlikely to conquer the predominantly Shia areas where Iraqi oil production and exports are concentrated. However, isolated attacks on key infrastructure, which could tighten short-term market balances and increase already high prices, cannot be ruled out. Over the long-term, the capacity expansions and export debottlenecking necessary to meet production targets will be more difficult for the increasingly fragmented and distracted federal government to achieve. In the north, the stalemate over Kurdish oil impacts Iraqi production volumes and broader regional politics between Baghdad, Irbil, and Turkey. The Kurdistan Regional Government's de facto control over oil hub Kirkuk, seized in the wake of confrontations with ISIL, could affect its bargaining position over independent oil exports and revenue sharing arrangements.

Yemen is a small energy producer, but its infrastructure is a frequent target of militants and its oil and natural gas exports have been regularly disrupted as a result. Beyond the Arabian Peninsula, offshore energy resources in the eastern Mediterranean could be a source of conflict or cooperation among Israel and its neighbors. There is cause for optimism with the recent Israel-Jordan gas pipeline deal. Oil has played a secondary role in the Syria crisis, but its limited production has been mostly offline since the conflict intensified.

The Middle East's importance to global markets and the U.S. commitment to regional security endure regardless of domestic production and import trends. The United States will remain part of the global oil market. It will pay global prices for oil and will continue to be affected by disruptions and political developments elsewhere, particularly the Middle East, regardless of where it physically gets its oil. The United States will also continue to have an interest in the free flow of energy to well-supplied global energy markets, for the benefit of its allies across producing and consuming regions. The characteristics that make the Persian Gulf uniquely pivotal to energy security – its production volumes, spare capacity, and perceived risks to the Strait of Hormuz – will not automatically become less important due to U.S. production growth.

While the United States will continue to have an interest in the free flow of oil through the Strait of Hormuz, China's interest will grow substantially. Beijing might simply rely on the United States to guarantee freedom of navigation, or alternatively may choose to field forces capable of defending its growing interests in the Middle East.

### *Asia-Pacific*

In many regions, energy trends are expected to change the magnitudes of trade, but not their direction – most net exporters and importers will continue to be net exporters or importers. Like North America, the Asia-Pacific is an exception. North America's increased energy abundance prompts a transition from large net imports, largely due to U.S. consumption needs, to the potential for a structural surplus in energy. The sea change in the Asia-Pacific is due to a widening energy deficit, which it must make up for with imports from the rest of the world.

Even though the Asia-Pacific's growing aggregate consumption needs are overwhelming, the region is a diverse one from the standpoint of energy markets and security. There are advanced economies like Japan and South Korea that have almost no domestic production, but which can afford to import large volumes of

LNG and other forms of energy on the global market. Developing economies like Pakistan and some southeastern Asian countries also have almost no domestic production, but have limited financial ability to import and market energy at global prices, creating energy access and economic challenges. Indonesia and Malaysia are among the traditional net energy exporters that have increasingly bifurcated markets where demand is outstripping production. This is partially the case in Australia, which is among the largest producers and exporters of coal and uranium, and is poised to become the world's largest LNG exporter, but has yet to adjust to its role as an increasingly large net importer of oil. Finally, there are rapidly growing emerging markets like China and India where production is high (both countries produce much of their enormous coal needs, and China is still one of the world's five largest oil producers) but consumption is even higher, and energy access, affordability, and sustainability problems must all be confronted.

Emerging markets in East and South Asia are the source of a large share of current and expected energy demand growth, changing the global geography of energy. China is already the largest energy consumer and greenhouse gas emitter. It will drive energy demand growth this decade, with India expected to dominate next decade. According to many projections, over half of the roughly 50% increase in global energy demand through 2040 will be attributable to China and India alone.

Non-OECD countries already consume more coal and natural gas than the industrialized West, and are passing the OECD in oil consumption this year. Non-OECD Asia also has the fastest growing wind, solar, and other renewable energy sectors, as overall electricity capacity expands. Fossil fuel consumption continues to grow at environmentally unsustainable rates, with serious implications for climate change mitigation efforts. These trends are driven by economic growth, but are exacerbated by subsidies and prices that do not send effective market signals. India and China recently liberalized some prices, but markets remain relatively rigid.

China consumes half the world's coal. According to some estimates, China builds the equivalent of two coal-fired power plants each week. If it continues on its current path, Asian coal consumption growth alone would overwhelm other efforts to mitigate climate change. For example, under some International Energy Agency scenarios, growth in Asian coal demand will represent half of global growth in greenhouse gases from all energy-related sources. Beyond climate change, domestic grievances over China's extreme air pollution have made the environment an internal security problem.

Cleaner-burning natural gas is growing rapidly in countries like China, albeit from a small base. More efficient regional natural gas markets could potentially shift coal demand trends, but other reforms would also be necessary and cheap coal will be difficult to displace. One area of focus has been domestic shale gas potential, which is large in both China and India. Asian companies have invested billions of dollars in U.S. shale joint ventures – raising some intellectual property concerns, but providing important financial support to U.S. operators – in search of both profits and production expertise that they can apply to their own countries. However, the right rocks must be matched with the right regulations, physical infrastructure, and market infrastructure, as well as advanced technologies, to repeat the U.S. shale revolution abroad. Thus far, China’s shale gas has been expensive to extract and expected production volumes are low relative to market needs.

Without a transformation in the availability and cost of other domestic fuels or renewable forms of energy to compete with coal, China will need to balance the geopolitical implications of increased imports with the environmental implications of its current consumption. The recently announced natural gas pipeline and trade deal with Russia is productive from the perspective of increasing China’s access to less carbon-intensive fuels at prices that are more competitive with coal.

The Fukushima Daichi disaster and the government’s response to it curtailed Japan’s nuclear capacity, prompting a greater reliance on imported oil and LNG. Most forecasts expect a partial recovery of Japan’s nuclear generation, along with much greater nuclear capacity expansion in South Korea, India, and especially China. But the disaster prompted renewed safety concerns, which have had far-reaching implications for the nuclear industry within the region and beyond.

A growing share of inter-regional energy trade is destined for Asia. China is a larger net oil importer than the United States (though the United States still imports more crude oil on a gross basis and is the larger oil consumer). These trends drive closer political and economic ties between Asia, the Middle East, and other regions. China’s “go-out” strategy affects its relationships with individual countries, including in its “oil-for-projects” model (e.g., Angola) and “oil-for-loans” model (e.g., Venezuela and Ecuador). It has a significant presence in Africa and gained a foothold in some countries by claiming it is driven exclusively by commercial rather than political motives, with no interest in questioning the nature of other regimes or conditioning investments. China’s policy of non-interference in the domestic affairs of other countries has found its limits in Libya and South

Sudan, where new governments interpreted China's engagements as implicit support for old regimes.

A large proportion of Persian Gulf oil passing through the Strait of Hormuz, as well as the Strait of Malacca, is destined for China, India, Japan, and other Asian markets. As noted above, fears about the security of the straits are largely exaggerated because states usually have a shared interest in continued flows. However, non-state actors engaged in piracy or terrorism could have a very different set of motivations. The United States is largely responsible for bearing the costs of securing sea lanes, creating a potential source of cooperation with or leverage over countries dependent on flows through vulnerable chokepoints.

Maritime security concerns and competing territorial claims in the East and South China Seas have some basis in energy – both in terms of resources under the seabed and the transit of trade on the sea itself – though many other issues of sovereignty also apply. Heightened tension around a Chinese drill rig in waters claimed by Vietnam is just the latest example. One response to maritime disputes could be a shared commitment by all countries affected to provide reassurance – for example, along the lines of the 1972 U.S.-Soviet Incidents at Sea agreement.

Non-OECD Asian demand growth threatens the efficacy of international energy institutions structured around the industrialized West. The International Energy Agency's Association process is one attempt to integrate new sources of demand into existing frameworks. Some institutions, such as the Asia-Pacific Economic Cooperation forum, are attempting to foster coordination at a regional level. Transparency is also an issue. The oil market, for example, flies increasingly blind because an increased share of energy consumption occurs in countries for which some energy data is unavailable or unreliable. As one means of mitigating these problems, membership in the IEA should be more aggressively expanded to include all major energy trading countries.

Non-OECD Asian energy consumption trends, particularly in China and India, also make the region central to global efforts to address climate change. The United States and China have already taken initial, auspicious steps to cooperate on emissions reductions and clean energy promotion. Secretary Kerry and his Chinese counterpart established the U.S.-China Climate Change Working Group last year. The two countries have since announced action initiatives, agreed to share information regarding post-2020 plans to limit greenhouse gas emissions, and pledged to pursue further multilateral approaches to reduce the use of hydrofluorocarbons (a potent greenhouse gas). The major challenge and

opportunity that large consuming countries now confront is how to take bolder steps to reduce greenhouse gas emissions and air pollution from energy use, and how to balance the costs of that action with benefits in shared areas of interest and concern.

### *Africa*

Africa is at the center of the “resource curse.” Several countries are large energy producers, but the revenues from that production have generally not translated into broad-based economic growth or trickled down into widely shared benefits for the population as a whole. The rise of the middle class means Africa is also emerging as an important source of demand growth, including in larger and more advanced economies like South Africa. As in other regions, energy subsidies threaten individual countries’ fiscal health, such as in Egypt.

Energy access remains a persistent challenge. Africa, along with Asia, accounts for many of the 1.3 billion people around the world who lack access to electricity, or the 2.7 billion who lack access to clean cooking fuels. Biomass is still a crucial form of energy where other sources are unavailable. For many countries in Africa, the most basic energy security imperatives – consistent access to commercial energy, at reasonable prices – are not met, impacting economic opportunities and creating political challenges.

Events across the continent illustrate how energy resources can create conflict, fuel insurgencies, and generate grievances. Disputes over the domestic allocation of resources can quickly become international economic or national security issues. Civil strife in Libya continues to account for a large share of the historically high level of oil disruptions around the world. Oil has fed internal unrest, driven autonomy movements, and served as a means for local militants to exert leverage over Libya’s federal government. Nigeria has long been plagued by a complex brew of corruption, sector mismanagement, oil theft, and oil spills that has created the conditions for armed insurrection and limited the country’s potential. Energy assets were terrorist targets in Algeria, when the In Amenas natural gas facility was attacked in January 2013. Oil has been a significant factor in conflicts within and between Sudan and South Sudan, with sustained disruptions to production and exports from the latter. Assistance that improves energy governance, as difficult as it is to implement, is one way to give people a stake in the economy and minimize the role of resources as a potential catalyst of conflict.

Other countries in Africa are less important from a global markets perspective, but energy there still has localized implications due to its effects on domestic politics

and economics, regime capabilities and behaviors, or regional security. Equatorial Guinea, Gabon, Congo, and Chad are among the many countries where energy – or minerals and other resource sectors – create governance challenges. Meanwhile, piracy continues to threaten international trade off the coast of Somalia and in the Gulf of Guinea, where there is a strong relationship between energy issues and potential security issues.

U.S. oil imports from North and West Africa have fallen dramatically because refineries are replacing the light, sweet crude those countries export with growing volumes of cheaper, domestically-produced light, sweet crude. Some have questioned whether U.S. interests or leverage in Africa will change as oil imports decline. The answer is no. Nigeria, Algeria, and Angola have been able to redirect their oil to Europe and growing Asian markets, minimizing the economic and fiscal costs to them of reduced U.S. imports. The geopolitical significance of this shift is also limited, as the physical origins of crude oil have little direct bearing on energy security in a fungible oil market, and regional engagements are overwhelmed by other national security interests.

New production potential in East and West Africa could extend the frontiers of energy markets and create either economic opportunities or the recipes for conflict. This could be an important part of the geopolitical landscape for countries including Ghana, Tanzania, Mozambique, Kenya, and Uganda or their neighbors. The combination of good governance and transparency will be essential to economic and human development throughout Africa. A lack of good governance becomes a national security issue wherever state or non-state actors perceive disconnects between the benefits they can generate from legitimate economic or political opportunities and the wealth and power others accrue from energy.

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## Appendix A – Recommendations

*Understand that major shifts in energy flows, the global economy, and attendant political relationships require that the United States government, including the Department of State, view and act on energy issues in integrated, comprehensive, and strategic terms.* Failure to do so will lead the United States to continue approaching these issues, with all of their ramifications for every region in the world, in isolated and inadequate ways. This change in outlook and approach to energy, beginning at the highest levels of the Administration and extending to the halls of Congress, is necessary for other recommendations to be effective.

*Retire references to energy “independence” or “self-sufficiency.”* These terms describe implausible or undesirable energy market end states. Even with the growth in fossil fuel production and increased use of renewable energy, “independence” for the United States will not be possible in any meaningful economic or political sense. Use of the term creates unrealistic expectations at home, distracting from genuine policy issues. It feeds feelings of insecurity abroad, causing other countries to speculate that the United States could retreat behind its borders. The United States should instead emphasize that energy markets are global and energy security is shared.

*Reassure other countries that energy trends do not undermine U.S. commitments to the Middle East and freedom of navigation and trade.* Demonstrating continued U.S. commitment to regional security, maintaining a strategic presence, and promoting conflict resolution will, along with more disciplined messaging about energy interdependence, help to alleviate some concerns that the United States will disengage from the Middle East due to its energy trends. Nonetheless, misperceptions will persist. Policymakers must anticipate how perceptions, even mistaken ones, might drive geopolitical realities and take corrective actions. They must also demonstrate that even “rebalancing” to Asia, fiscal austerity at home, and military drawdowns will not diminish U.S. engagement in the Middle East and relationships with its allies and partners. Energy trends merely reinforce prior conceptions about a changing U.S. presence and commitment due to these factors.

*Increase bilateral and multilateral cooperation on maritime security.* Changing patterns of energy trade do not lessen U.S. interests in freedom of the seas, even as other countries “free-ride” on U.S. security. But they do create opportunities for security engagements. In blunt terms, this can be a source of cooperation and amity, or of friction and discord between the United States and China. Given the other challenges in the relationship with Beijing, it is better to make use of the

former. The Departments of State and Defense should explore whether increased trade flows through the Indian Ocean and Strait of Malacca, in the context of a broader U.S. naval presence, can create space to explore new basing arrangements. Energy's role in changing maritime security perspectives provides yet another justification for reinvigorating Administration and Congressional efforts to ratify the United Nations Convention on the Law of the Sea.

*Elevate the role of energy in transatlantic relations and pursue concrete policies to reduce dependence on Russian energy.* U.S. officials should encourage Europe to address energy in strategic as well as traditional commercial terms, foster a sense of urgency about current vulnerabilities, and assist Europe in creating a more unified and less political market for natural gas. The ability of Russia, or any other country, to manipulate Western economies through energy will be mitigated if the European energy market is integrated (through both physical and "soft" infrastructure), based on market pricing (including by eliminating destination clauses and other restrictions on flows), and if energy bills are paid in full and on time (including by Ukraine). Specific steps Europe should be encouraged to take include fully implementing Third Energy Package regulations, jointly agreeing to and securing EU funding for priority infrastructure projects (e.g., interconnectors and reverse-flow pipelines), increasing gas storage levels, and preparing contingency plans for disruptions. Over the longer-term, Europe can reduce its dependence on Moscow through a combination of developing alternative supplies, renewable energy sources, nuclear power, and additional LNG imports from the United States and elsewhere. Regardless, Russia will remain a key component of European energy markets, and Russia must be part of a workable energy regime. The West needs as rapidly as possible to develop options in order to give Russia incentives to be a "responsible" player in energy markets.

*Elevate, within the State Department and other agencies of national security, consideration of energy issues.* The Department's creation of the Bureau of Energy Resources in 2011 was a welcome reflection of energy's central role in diplomatic priorities. Energy's prioritization should also occur within each regional bureau, including through close relationships with functional bureaus and the Policy Planning Staff (S/P). This will require basic, integrated, strategic analysis, planning, and policy formation, as well as additional resources for and attention on energy, both at State and in the interagency process. "Energy" must be seen in comprehensive, not piecemeal, terms. State should also take the lead, along with the Energy and Commerce Departments, in engaging the private sector (especially the energy sector) in crafting viable national energy strategies for the United States.

*Within both Congress and the Administration, take a more strategic approach to developing an integrated energy policy.* Many domestic energy policies and activities with foreign policy implications are governed by other agencies through a complex array of statutes, regulations, and executive orders, or determined by the private sector. For example, while oil and LNG exports have foreign policy implications, the Department is not responsible for licensing them and the government does not “use” energy for leverage over other countries. The United States is a reliable energy supplier and a free-market orientation to energy trade could enhance the general stability and flexibility of the global energy system, but trade reforms are not without opposition due to potential environmental and distributional impacts. Approaching energy issues in isolation sacrifices the political leverage needed to build compromise around larger and more effective policy bargains that would address environmental impacts and foreign policy concerns as well as create more efficient markets. A comprehensive energy policy would address simultaneously the triple imperatives of energy security by guaranteeing physical access and security of supply for the U.S. and its allies (including through a nimbler approach to strategic petroleum reserves), promoting affordability and efficiency through open markets (including trade reforms related to oil and gas exports), and advancing environmental sustainability (including through carbon pricing and demand reduction).

*Redouble efforts to support the inclusion of new supply and demand centers in international energy architecture.* Most energy security cooperation is built around the OECD and organizations must incorporate the countries now driving demand growth to remain relevant. The IEA Association process is one important element of this effort. Extension of IEA membership to other countries, like Russia, should be pursued, but must also hinge on their respect for international norms. Policymakers should consider how the prospects of accession to the IEA or other institutions can be both credible and attractive enough to shape incentives.

*The Department and broader Administration should reinvigorate and refocus efforts to advance fossil fuel subsidy reform.* Fossil fuel subsidies are often pernicious, exacerbating energy overconsumption, underinvestment in domestic production, and market distortions, while undermining individual countries’ fiscal stability. The problem is especially acute in Middle Eastern countries, but also played an important role in creating the conditions for the Ukraine crisis. The United States and other countries have long advocated for fossil fuel subsidy reform. But other governments know all too well why subsidies are problematic – reform is simply difficult because subsidies form part of the social contract in

many countries. The Department should disseminate information abroad about the effects of subsidies and engage in targeted outreach to civil society to create more political space for subsidy reform.

*Addressing the risk of climate change demands far-reaching reforms to the energy sector, even with the recognition that this will take many years to achieve and will require daunting efforts by the United States and many other countries.* Climate change is an urgent threat to national and global security, and energy is its largest driver. Existing policies, at home and abroad, are inadequate to mitigate the large social costs of growing fossil fuel use. This may be one of humanity's most difficult challenges: addressing environmental externalities within one country is hard enough, let alone coordinating all countries to transform an entire global energy system. The authors of this report believe fundamental economic and political choices must be made to reduce carbon emissions. Sufficient data on anthropogenic climate change exists to pursue the societal equivalent of an insurance policy, and commit more resources to mitigating uncertain but potentially large risks related to the energy sector.

The United States and China are central to the task, given the scale of their current and future emissions. Europe, other countries of the industrialized world, and India will also be crucial, and need to share in leadership on this critical determinant of the planet's future. If a small group of large consumers can work together on these issues, it could inspire other countries to also take action and participate in innovative strategies to limit greenhouse gas emissions.

Ultimately, economy-wide energy policies – especially a carbon tax – will be necessary to address negative externalities in a comprehensive and economically rational way. A domestic price on carbon with a significant border tax adjustment could also create the leverage necessary to advance international negotiations with China and other countries.

## Appendix B – Terms of Reference

UNDER SECRETARY OF STATE FOR  
ARMS CONTROL AND INTERNATIONAL SECURITY  
WASHINGTON

July 17, 2013

### MEMORANDUM FOR THE CHAIRMAN, INTERNATIONAL SECURITY ADVISORY BOARD (ISAB)

SUBJECT: Terms of Reference – ISAB Study on Energy Geopolitics –  
Challenges and Opportunities

The ISAB is requested to undertake a study of changing global energy geopolitics and the related international security challenges and opportunities for U.S. foreign policy.

The United States likely will face a changing global energy market during the next several decades that will have large effects on its international security relationships. The majority of global energy consumption will be driven by demand growth outside of the industrialized world. Global spare oil production capacity likely will remain focused in the Middle East, even as new hydrocarbon producers emerge in other regions and there are shifts in the global fuel mix. While decreasing U.S. energy imports, lower U.S. oil use, and increasing domestic production will provide the United States with important benefits, the characteristics of world energy markets preclude the United States from sheltering itself entirely from the effects of international energy prices. The changing patterns of supply growth, greater diversification of energy markets, and the globalization of natural gas likely will have significant and important effects on bilateral and multilateral relationships. A study of the changing characteristics of international energy markets and their predicted effects on U.S. security relationships could help the United States identify and formulate plans to manage future international security challenges as well as opportunities.

After reviewing how international energy markets are projected to change over the next few decades, it would be of great assistance if the ISAB could examine and assess:

- Resulting security challenges for the United States. Specifically, identify and assess energy market changes that would lead to new regional and global power shifts, changes in power relationships, expected shifts in alliances, impacts on international institutions, and potential international conflict. Identify U.S. policies that would help mitigate or optimize these effects to U.S. benefit.
- Resulting opportunities for the United States. Specifically, identify and assess energy market changes and U.S. policies that would result in reduced U.S. dependence on foreign energy sources, greater U.S. economic and policy influence and improved international relations, improved insulation from harmful market effects, enhanced nonproliferation, increased long-term energy spare capacity, increased long-term sustainability, and shifts in fuel-use patterns that would result in global environmental benefits.

During its conduct of the study, the ISAB may expand these tasks, as it deems necessary. I request that you complete the study in 270 days. Completed work should be submitted to the ISAB Executive Directorate no later than April, 2014.

The Under Secretary of State for Arms Control and International Security will sponsor the study. The Special Envoy and Coordinator for International Energy Affairs will support the study. Michael Brakke will serve as the Executive Secretary for the study and Chris Herrick will represent the ISAB Executive Directorate.

The study will be conducted in accordance with the provisions of P.L. 92-463, the “Federal Advisory Board Committee Act.” If the ISAB establishes a working group to assist in its study, the working group must present its report or findings to the full ISAB for consideration in a formal meeting, prior to presenting the report or findings to the Department.

  
Rose E. Gottemoeller

## **Appendix C – Members and Project Staff**

### **Board Members**

Hon. Gary Hart (Chairman)  
Hon. Charles B. Curtis (Vice Chairman)

Dr. Graham Allison	Dr. Raymond Jeanloz
Dr. Michael Anastasio	Dr. David A. Kay
Hon. Douglas Bereuter	Gen. Lester L. Lyles (USAF, Ret.)
Dr. Bruce Blair	Gen. Montgomery C. Meigs (USA, Ret.)
Amb. Linton F. Brooks	Rep. Harold P. Naughton Jr.
Brig. Gen. Stephen A. Cheney (USMC, Ret.)	Hon. William Perry
Mr. Joseph Cirincione	Mr. Robert N. Rose
Amb. Robert Gallucci	Lt. Gen. Brent Scowcroft (USAF, Ret.)
Hon. Sherri Goodman	Hon. Walter Slocombe
Amb. Robert E. Hunter	Dr. James A. Tegnalia
Hon. Shirley Ann Jackson	Hon. William H. Tobey
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### **Study Group Members**

Dr. David A. Kay (Chairman)

Dr. Graham Allison	Dr. William Perry
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Amb. Robert E. Hunter	Hon. William H. Tobey
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Mr. Michael T. Brakke  
Executive Secretary

Ms. Thelma Jenkins-Anthony  
ISAB Action Officer

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## **Appendix D – Individuals Consulted by the Study Group**

**July 23, 2013**

Amb. Carlos Pascual                      Special Envoy and Coordinator for  
International Energy Affairs, U.S.  
Department of State

**September 20, 2013**

Dr. Howard K. Gruenspecht              Deputy Administrator, U.S. Energy  
Information Administration, U.S.  
Department of Energy

Ms. Sarah O. Ladislaw                      Director and Senior Fellow, Energy and  
National Security Program, CSIS

Ms. Elizabeth Hague                      Senior Foreign Policy Analyst, Office of  
East Asia and the Pacific, U.S. Department  
of State

Dr. Joshua Handler                      Division Chief, Office of Strategic,  
Proliferation, and Military Analysis, U.S.  
Department of State

Mr. Oliver Melton                      Economic Analyst, Office of Economic  
Analysis, U.S. Department of State

Assigned Briefers                      Central Intelligence Agency  
U.S. Department of State

**December 3, 2013**

Dr. Fatih Birol                      Chief Economist and Director, Global  
Energy Economics, International Energy  
Agency

**December 4, 2013**

Hon. Sharon E. Burke	Assistant Secretary of Defense for Operational Energy Plans and Programs, U.S. Department of Defense
Dr. Erica Downs	Fellow, Foreign Policy, John L. Thornton China Center, Brookings
Dr. David F. Gordon	Head of Research and Director, Global Macro, Eurasia Group
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