Atlantic Council

GLOBAL ENERGY CENTER

REPORT OF THE ATLANTIC COUNCIL TASK FORCE ON

REFORM OF THE GLOBAL ENERGY ARCHITECTURE

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Cover photo: Still Vision/Flickr. View of Seattle at night, 2012.

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Between September and December 2016, the Atlantic Council convened a high-level task force to examine the state of international energy governance, and to determine if and how the prevailing institutional regime could benefit from reform. The following paper represents the outcomes of those discussions—outcomes that are designed primarily to support decision-making within a new American administration, but also ones that are intended to resonate for practitioners of international energy policy across the globe.

The Task Force found that international institutions and governance continue to provide tangible benefits to an evolving global energy economy and to specific American interests. Promoting market stability, addressing market failures, facilitating trade and investment, and ensuring peace and security are enhanced by multinational cooperation.

Institutions, however, are imperfect, and are often slow to adapt to historical change and new priorities. Updating them requires striking the right balance between effectiveness and inclusiveness, leveraging capabilities to empower local or private actors, and focusing on the policy issues that are most pertinent in a changing world.

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This report represents a consensus position of the Task Force. Individual members should not be presumed to endorse specific sentences or wordings herein. The views of Task Force members do not necessarily reflect those of their affiliated institutions.

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CONTENTS

INTRODUCTION

Energy security—defined as affordable, reliable access to the energy resources required for national prosperity—has been a cornerstone of US national security for decades with strong bipartisan consensus. In both periods of scarcity and times of abundance, the United States has protected its interests by fostering open trade, resisting attempts by countries to withhold the supply of critical resources (from oil and gas to rare earth minerals), and sustaining American energy production by assuring access to export markets. Experience has shown that domestic security is enhanced by promoting the diversification of supply worldwide to avoid the coercion of friends and allies. Energy security also entails sustainability. Propagating energy efficiency and alternative technologies reduces the dependence of America's partners on resources that may inhibit their economies, impair their environments, or impinge on their sovereignty. Extreme poverty, including energy poverty, leads to ungoverned spaces that can foster or host adversaries. Finally, the United States has worked to control the proliferation of nuclear weapons and promote safe nuclear power operations in part by sharing civilian nuclear energy technology and supporting its good management abroad.

None of this would have been possible through purely bilateral efforts to persuade countries of American power or wisdom. Rather, all of it has been accomplished at least partly through international and multilateral collaboration. While the multiple organizations, agreements, and regional groupings vary greatly in focus, representation, and binding nature, all can be considered forms of international energy governance. That does not mean supranational regulation; rather, it encompasses common efforts undertaken with foreign countries to set rules of the road that benefit sovereign security and economic interests.

TASK FORCE MISSION

At this time of dramatic change in energy markets, from the shift in demand from West to East, to the democratization of the energy supply, to the accelerating development of renewable technologies and digital innovation, to unprecedented international agreement on pursuing pathways to reduce the rate of the planet's warming to two degrees centigrade, the Atlantic Council Task Force set about to examine whether these arrangements are still necessary, if their structures are adequate to their tasks, and how they might be improved to be fit for modern purpose.

The Task Force also investigated whether current institutions adequately address twenty-first-century priorities such as improving electricity access. In an economic era driven by information and communication technologies (ICT), and one in which internet access acts as an economic multiplier, electrification is a fundamental component of growth and development. Given the strengths of the modern US economy, the spread of electricity, ICT, and associated skills is also key to market penetration for American companies and ultimately American jobs.

Beyond the economic calculus, energy security and sustainability at home and abroad are matters of national security. Resource competition is a classic driver of conflict, and US geostrategic interests are profoundly impacted by the distribution of energy wealth and concurrent flows of money and people. Nuclear energy technology has been closely linked to military capability for obvious reasons. And that is all before the discussion of the impacts of climate change on American lives and industrial assets, as well as American security interests abroad.

> "Energy security and sustainability at home and abroad are matters of national security."

The stakes for functioning international energy governance are therefore high, even when it comes to narrowly defined American interests. As a consequence, the Task Force worked in stages, first, to assess the current landscape and determine needs; second, to identify future policy priorities; and third, to identify institutional gaps and possible structural improvements.

ENERGY GOVERNANCE STILL MATTERS

With energy (and particularly oil and gas) remaining a strategic commodity, and given the control of foreign governments over much of those reserves, collective action is still needed to protect markets. The world learned this lesson through adversity. Pre-war Europe hoarded industrial supplies of coal and steel, driven by militaristic national competition. In the immediate aftermath of the 1973 embargo by Arab members of the Organization of the Petroleum Exporting Countries (OPEC), countries that had previously contracted bilaterally for supply were required to share supply by reallocating their holdings. Pricing and contracts of oil and gas were not transparent. Global supply was impeded by restrictions on access to energy resources, limiting the ability of capital to generate additional production. Nuclear energy held out significant promise, but the sector was vulnerable to safety issues and marked by ongoing concerns over nuclear waste and proliferation.

Institutions evolved to address these transnational challenges. A European scheme to integrate coal and steel markets formed the basis for post-war European union and peace, and eventually evolved into the European Union (EU) of today. The International Energy Agency (IEA) was born of the oil embargo in the early 1970s. The International Atomic Energy Agency (IAEA) was developed in the 1950s to promote safe, secure, and peaceful nuclear technologies.

Today's energy markets exhibit high volatility, making the need for accurate data in supply, demand, and inventories more important than ever. Major gaps and lags exist in energy supply and demand, inhibiting investment response. The tight oil and gas revolution may have reduced US net import dependency, but as long as oil is a globally priced strategic commodity, energy independence is an unrealistic prospect. America remains embedded in the international energy trading system and vulnerable to supply disruptions and price shocks. Demand for nuclear energy is rising in some parts of the world, making the need for safety and nonproliferation standards more critical. More countries need more energy, but lack the fiscal frameworks to attract investment.

A wave of popular nationalism in both industrialized and emerging economies could make cross-border investment in all energy sources and technologies more difficult in the years ahead. Others are entering the world of energy development, but with thin capacity to manage the revenues or the resources themselves. Many countries seek to increase energy access, reduce energy trade balances, and maximize the use of renewable technologies to reach citizens off and on the grid—but are challenged to navigate a path forward. Energy governance still matters to address today's risks and to facilitate tomorrow's investments.

ENERGY GOVERNANCE TODAY

The IEA is arguably the most wide-reaching and influential body that covers much of the fuel array and represents the developed countries. It conducts one "hard" function in recommending and coordinating the release of strategic oil stocks in the event of short-term supply disruptions, but it also serves as a clearing house for energy statistics, provides outlooks of the various fuel markets, and conducts analyses that aim to inform national policies. The IEA is the established forum for discussing energy issues among developed countries, and has recently made significant efforts to increase the involvement of major non-member countries like China and India. Yet, the IEA has little influence beyond its advisory role, and must work with multilateral financial institutions (MFIs), industry, and national governments to mobilize the investments it recommends. Under the leadership of Fatih Birol, the IEA has been more aggressively pursuing its outreach and striving to maintain institutional legitimacy in a world where its membership represents a diminishing share of energy demand. That includes taking over responsibility for the Clean Energy Ministerial, planning an office in China and hosting Chinese staff, and pursuing the established "Association" process to deepen ties with select non-members.

Beyond the IEA, a multitude of more narrowly focused institutions has evolved, many with specific mandates and various tools to achieve them. For example, the International Renewable Energy Agency (IRENA) was created with the support of the IEA and its members to encourage the development and adoption of renewable energy technologies.

In the oil market, an initial phase of extreme volatility around the turn of the century shifted the main focus to price stability, and institutional regimes gained significant power over prices. Beginning in the 1930s, that power lay largely with US producers (and the Texas Railroad Commission) and from the early 1960s on, with OPEC. The use of pricing power for political ends (and specifically the Arab OPEC embargo) led to the creation of the IEA as a consumer country counterbalance to OPEC. The International Energy Forum (IEF) evolved in the early 1990s as a purported interlocutor between the two groups, serving as a forum for producer-consumer dialogue.

Gas producers later tried to create their own OPEC with the Gas Exporting Countries Forum, with less success. Since 2008, the International Partnership for Energy Efficiency Cooperation (IPEEC) has been the leading international institution dedicated to efficiency promotion, but it is small (sixteen members) and has limited reach.

Nuclear power is a distinct sector, thanks to its link with nuclear weapons, nuclear-powered military platforms, and international security generally. Due to cost, the sensitivity of the technology, and public perceptions, the "club" is traditionally a small one with close industry-government cooperation. The IAEA is the main international body charged with verification of compliance with international agreements and safeguards, as well as facilitating nuclear technology development and safety standards. That work is supported by the Nuclear Energy Agency and industry bodies that provide standards and advice abroad (e.g., the Institute of Nuclear Power Operations, or INPO).

A host of other institutions, representing government or civil society, with various degrees of geographical or functional scope, also make up the constellation of international energy governance.

ASSESSING THE CURRENT LANDSCAPE

Over the past decade, fundamental changes in the global energy economy have taken place with considerable speed. At the same time, the natures of both industry and political institutional structures have also changed.

Since the 1980s, international energy companies (like much of the rest of the economy) have seen steady deregulation away from strict post-war industrial policies. Particularly in Europe, privatization and the erosion of national monopolies have generally introduced greater efficiency and competition, but also complicated the maintenance of public goods. In the United States, successive waves of deregulation of the natural gas and power markets have positively impacted production but have had mixed results for volatility and reliability.

The steady rise of market power, national deregulation, and intensified globalization has not been complemented by concurrently strengthened international regimes. To the degree that national governments have ceded control over their energy policies and companies, such diminished power stands in contrast to the continued understanding of energy as quintessentially linked to national sovereignty. Indeed, even in an age of fossil fuel abundance, relying on foreign monopolies for supply continues to pose fundamental security questions—notably in eastern Europe where Russian gas supply dominance has been a strategic concern for decades. Public policies to promote greater energy independence in both the US and China reveal similar concerns about foreign dependence in both places.

Yet institutions, particularly at the unelected supranational level, face greater pressure than ever before to prove their value in serving the public interest. The legitimacy of the international order requires a return to basics (reiterating the links between international engagement and local or personal welfare) even as efforts continue to make institutions more effective.

The rise of climate change politics, while controversial in the US (and elsewhere), has presented a broad case for internationally coordinated policy action. In the wake of the 2016 Paris climate agreement, implementing what has already been pledged and agreed upon will be the real test of that regime structure.

Economic shifts are also taking place against this political backdrop. Oil supply has been "democratized," with more suppliers entering the market at scale—notably the US, Canada, Brazil, and Kazakhstan. Efficiency gains have altered the rate of demand growth in emerging markets and rendered growth relatively flat among OECD countries. Spare production capacity has eroded. Saudi Arabia, long loathe to bear the entire burden of balancing the market in times of abundance, shifted to a market-share strategy in 2014 when it declined to cut production amidst falling prices. Looking forward, diminished upstream investment and reduced swing production mean the industry is set to experience more dramatic boom-bust cycles over shorter periods of time, inducing precisely the volatility that precipitated market management over a century ago. Periods of more extreme market tightening will increase the risk of the kinds of oil supply disruptions the IEA is designed to mitigate, highlighting the role of strategic stocks.

Meanwhile, an era of "great electrification" in coming decades will see electricity gaining ground in many end-use sectors. Electricity is projected to make up almost a quarter of final energy consumption by 2040. Emerging economies will lead, and renewables will account for more than half of the increase in total generation.

The eastward shift in energy demand is also significant. IEA outlooks project China's total energy demand in 2040 will be almost double that of the United States, even as structural shifts in the economy make it less energy intensive.[1] As China's economy has expanded it has developed some new and innovative frameworks. In the energy space, China seems content to collaborate with the IEA rather than create its own international energy organization, as some had surmised in the run-up to the G20 summit in 2014. China is investing globally in many areas, including energy, via the new Asian Infrastructure Investment Bank (AIIB), and Beijing is focused on regional collaboration and development through its One Belt, One Road strategy. As with its association with the IEA, China's charter for the AIIB aims to collaborate with the World Bank and other MFIs, expanding the available pool of capital. With the IEA estimating the need for $53 trillion in energy infrastructure investment by 2035 to achieve a two degree path, helping to directly facilitate that

1 *World Energy Outlook 2015*, International Energy Agency, 2015, https://www.iea.org/Textbase/npsum/WEO2015SUM.pdf.

A security personnel stands next to an Asian Infrastructure Investment Bank (AIIB) flag during the opening ceremony of the first annual meeting of AIIB in Beijing, China, June 25, 2016. *Photo credit*: Jason Lee/Reuters.

investment may be a particularly effective strategy to guide the process.

As China looks to development in the wider Asian region to sustain its own economic growth, growth in energy demand is projected to be strong in the Association of Southeast Asian Nations (ASEAN) countries as well as in central and south Asia. India in particular is set to lead in energy demand growth, heightening its importance within the global system. Such large growth markets are partly due to efforts to improve energy access.

Still, there is far to go in meeting the global ambition of providing affordable, reliable, sustainable, and modern energy for all people. An estimated 1.1 billion people, almost 15 percent of the global population, remain without electricity, largely in south Asia and sub-Saharan Africa.[2] The United Nations (UN) Sustainable Development Goals include a goal on energy, with the target to achieve universal access by 2030. The ability of these nations to improve energy access and reduce energy poverty will be driven by technological changes and micro-grids as well as by traditional development investments to expand and upgrade existing networks. It is unclear whether existing institutions are up to the task of helping these nations improve the investment framework to address the rapidly rising demand for lighting, communications, and internet connection among even the world's poorest.

2 "Our Mission," Sustainable Energy for All, Partnership between the United Nations and World Bank, http://se4all.org/our-mission.

IDENTIFYING FUTURE POLICY PRIORITIES

What then are the energy challenges and policy priorities of the twenty-first century, and how prepared are twentieth-century institutions to address them? How best can broad objectives of domestic energy policy (reliability of service, affordability of service, safety/security/health, interregional commerce, environmental concerns, and energy industry prosperity and jobs) be served by international institutions?

Markets. From a US perspective, the new landscape provides major opportunities to supply energy technology and digital energy management tools, as well as hydrocarbon commodities, to global markets. Fostering open trading systems to assure fair access to overseas markets, free trade in energy, and utility of strategic stocks will serve national prosperity.

Environment. Recognition of the need to manage environmental externalities, in terms of climate change *but also in terms of local air and water pollution*, is gaining ground. Large emerging-market emitters like China are embracing green investments at least as much to improve quality of life for their increasingly demanding populations, as to impact climate change. Propagation of clean energy technologies and clear domestic plans to address pollution issues can enable social welfare and supply security.

Terms of trade. Given the projected growth in international energy trade and new emerging trade routes, managing the terms of that trade will be increasingly important. Enhanced regional integration (for example, among ASEAN countries) can improve security of supply, enhance regional economic development, and (if done correctly) assure competitive markets. While bumpy, the European experience in moving toward a single energy market has enabled Europe to optimize its use of energy storage and reduce the threat of price discrimination. The advanced example of multinational gas and power market integration, not only from regulatory and tax standpoints but also in terms of actively promoting interconnectors, has reduced the market power of local monopolies and external actors like Russia. The EU's carbon trading scheme, independent oil stockholding regime, and pipeline access rules are particularly advanced for a regional bloc.

But questions about institutional efficacy are pertinent. Can the moribund Energy Charter Treaty, designed to provide a dispute settlement and trade regulation compliance regime in Eurasia, provide some model for similar arrangements worldwide as liquefied natural gas, electricity, and oil markets become increasingly global—an energy World Trade Organization? Is the IEA an appropriate organization to take on those kinds of roles? Or do rising energy trading hubs—for example, with regard to gas—provide sufficient regional trade regimes in practice?

Energy access. Modern energy services are crucial to economic development in a technological world, with distinct benefits for American business. But they are also key to American security, particularly where those interests are intense and electrification is critical (such as in Pakistan, Egypt, Afghanistan, and Iraq). Improving energy access will be driven primarily by the private sector and new technologies, but institutions can provide critical support and impact market conditions for investment.

> "Large emerging-market emitters. . . are embracing green investments at least as much to improve quality of life for their increasingly demanding populations, as to impact climate change."

Nuclear power. When it comes to nuclear power, the traditional model of a few large players, closely linked to national governments, that undertake rare but large-capacity investments, is giving way to high growth in some emerging economies (notably China), and also to new small modular nuclear technologies that can empower a multitude of independent players to enter the market. Are traditional international safety, security, and risk mitigation regimes sufficient to manage this transition and the rapid spread of the nuclear club to new countries and new business models?

Cyber security. Technological changes mean an ever greater role for digital technologies in energy infrastructure and production, facilitating greater

Oil tanks are seen at a Sinopec plant in Hefei, Anhui province, May 31, 2009. *Photo credit*: Jianan Yu/Reuters.

awareness and efficiency but also tying transnational networks more tightly together and exposing the sector to cybersecurity risks. Effectively managing those risks augurs for international coordination.

In all these areas, a fundamental question must then be, what degree of international governance are we comfortable with to meet those objectives? At the local level, when power grids or distribution networks are shared across borders, the need for bilateral or multilateral frameworks are essential for reliability and security. At the next level, market failures that produce negative cross-border externalities like pollution or market instability can be addressed only through international coordination.

More controversial may be efforts to guide or coerce domestic policies that impact welfare in other countries. A core principle of contemporary multinational governance generally is that policy must be driven by nations themselves, but international institutions can certainly provide guidance through information provision.

From a structural point of view, is the future of governance in this area better with multiple cores (e.g., regional, sectoral, functional), or does the interdependence of policy objectives justify centralization? If it is the latter, should that centralization entail an expanded IEA, or should it happen among groups that are either more diverse (e.g., G20) or more inclusive (e.g., the UN or something new)?

Within this context, the Atlantic Council Task Force discussed such questions over the course of three meetings to address systematically the issue areas listed above—assessing governance, identifying policy priorities, and addressing specific institutional change.

During each session, the Task Force was briefed by specialists and high-level practitioners who provided input and practical experience with regard to the subject matters at hand.

The Task Force, after deliberation, has established a set of the following findings and principles to guide its approach to international energy governance, and that support its final recommendations.

FINDINGS

International engagement remains fundamental to US interests, including in the energy sphere. The world, and particularly the energy market, is deeply connected, and responsible global leadership has brought enormous benefits to the welfare of the American people.

The post-war era of American preeminence was rooted in a security and economic architecture that fostered stability and prosperity abroad as well as at home, and one that provided opportunities for American industry to spread around the globe. Building on that success means recognizing the role of functional international governance. Ultimately, the combination of a stable international system rooted in market principles, the fair distribution of benefits, protections for individual citizens, and investment in the foundations of prosperity continues to be the optimal state for advancing human welfare.

The positive impact of global engagement is not theoretical. US jobs, innovation, and competitiveness are built on America's ability to attract the best talent, sell its products to the world, and lead in a changing and technological economy.

Ceding global leadership would provide an opportunity for global competitors who are only too eager to take it up, with negative implications beyond the energy economy and impacts on America's national security.

Energy governance today is disaggregated. The existing institutional structure is limited in some cases by representation and membership that is inconsistent with contemporary realities, and in other cases by a lack of capacity. The tension between inclusiveness and effectiveness is sometimes inherent, and a ranking American energy official emphasized to the Task Force the trade-off within existing organizations. Those that sought the broadest membership, like the IEF or the UN, sometimes suffer from lower effectiveness. Meanwhile, groups where more concrete progress has been made in terms of policy or technical consensus are those whose memberships reflect more narrow interests and aims.

The reality is that the existing mishmash represents ongoing imperfect compromises, leaving space for improvement. There are many strengths in IEA capacity, and they are complemented by specialized attention from organizations in other areas (including renewables, nuclear power, energy efficiency, energy poverty, etc.). At the same time, IEA membership does not include China, India, or other large and growing energy powers. When it comes to effectiveness, the IEA could improve with an increased budget and a greater focus on capacity building. And on the implementation side, there is the need for better coordination with lenders to mobilize financing and realize new projects on the ground. The Task Force examined whether the existing multiplicity of institutions was a limitation, and what that would mean in a world where skepticism about multilateral authority is rife. In a world with consensus on goals and missions, consolidation might in some cases make sense and improve scale.

> "The positive impact of global engagement is not theoretical."

But in terms of energy policy and governance, international consensus is elusive. This became clear as the Task Force looked around the world, and heard from national representatives.

China and others are still cautious about "going all in" with the IEA, for example, as a singular global energy institution. Despite Beijing's increasing engagement with multilateral institutional frameworks, China remains concerned about their efficiency compared with that of bilateral arrangements. Where Beijing engages further, it will need to be convinced of concrete benefits, and technology transfer is of particular interest. When it comes to the IEA specifically, China sees its value as a conduit for policy communication and exchange, but may be unwilling to depend on an institution rooted in established cultural norms and policy interests. At the same time, there does not appear to be the political appetite or capability to create a new or stand-alone group. In addition, following the US elections, there is significantly more divergence on international policy priorities (particularly with regard to climate issues and renewable energy technology deployment). Even in Europe and among EU members, there are significant divergences in energy policy priorities among different geographical groupings within the club.

Participants attend the end session of the 15th International Energy Forum Ministerial (IEF15) in Algiers, Algeria September 28, 2016. *Photo credit*: Reuters/Ramzi Boudina.

Therefore, in an environment of weak consensus, the Task Force found that multiplicity can be a strength rather than a weakness. A menu of groups can allow diverse agendas to be pursued while minimizing conflict. Opting in and out of particular initiatives can allow for more effective coalitions, and flexible financing arrangements can allow smaller groups to move ahead in specific policy areas.

Many arrangements are still in need of updating and adjustment, which should be taken on a case-by-case basis. Existing programs or institutions may have even outlived their usefulness. And in some instances, mechanisms for better coordination or streamlining can create better alignment. But institutional consolidation as such does not necessarily provide better solutions in today's political environment.

PRINCIPLES FOR CHANGE

Based on these broad findings, the Task Force established basic principles for change when it comes to providing policy recommendations.

Avoid institutional proliferation. While it is true that multiplicity can be a strength, existing overlaps in the regime complex are the result of institutional creation to address specific issues and crises, and subsequent inertia that locked them in absent a sunset clause. The Task Force therefore seeks to focus on reforming existing structures and, where possible, rationalize redundancies.

Seek to address fragmentation gaps. Representation, coordination, and implementation continue to be the areas where gaps exist—sometimes because they can be in conflict. However, within each sector and governance regime, these three areas should be systematically reviewed to determine efficacy and the optimal balance.

"Alliance" versus "coalition." Different problems may require different approaches, and in its findings, the Task Force acknowledges the potential value of multiplicity, which carries through to its recommendations. Alliances are useful to set broad principles and establish common values, but coalitions can be more effective at pursuing specific aims in a world with less consensus.

"Institutions are under ever greater pressure to prove their value and their service to the popular will."

Be aware of the diminishing popular legitimacy of institutions, especially multilateral ones. In the current political environment, institutions are under ever greater pressure to prove their value and their service to the popular will (if not the popular good). That fact should inform any recommendations, in terms of both substance and communication.

RECOMMENDATIONS

Sustain and communicate US commitment to international energy engagement

The United States benefits directly from oil security, gas security, the opening of markets for renewables and nuclear investments, and energy poverty reduction. It is not in the national interest to withdraw—doing so would cede leadership, forfeit lucrative markets, and could allow less market-based and less transparent competing models to prevail.

The United States should reiterate and sustain its commitment to international energy governance. Practically that means maintaining and reinforcing domestic structures in the State Department (Bureau of Energy Resources), Department of Energy (Office of International Affairs), and the White House (Senior Advisor at the National Security Council), and also supporting core international institutions like the IEA, IAEA, IRENA, and initiatives like the Clean Energy Ministerial.

In terms of communication in the new political reality, the United States benefits from

- encouraging its policy makers to recognize and sustain the United States' commitment to international energy governance;
- recognizing the benefits to narrowly American interests of clear data, collective response to supply crises, energy poverty reduction, technological exchange, and reducing long-term global dependency on hydrocarbons;
- underscoring the national security interest in international engagement in the energy sphere; and
- drawing the link between American interests and the risks of ceding global development and innovation agendas to competitors.

Boost scope for improving governance in regulatory and fiscal frameworks to enable business opportunities, industry, and global investment

The ability of developing countries to attract investment, improve energy access, and diversify energy sources is often hampered by weak fiscal and regulatory frameworks and weak institutional capacity. Current efforts in energy regulation and international capacity building are constructive but limited. International organizations may offer tailored programs within their areas of expertise, but the interconnected nature of energy policies and regulations calls for more comprehensive tools.

The Task Force therefore supports the following measures:

- Sustaining US programs to engage in regulatory capacity building abroad (such as the Energy Governance and Capacity Initiative), as a tool for facilitating penetration of new (potentially American) technologies (e.g., renewable energy technologies into developing economies), and for managing fossil fuel windfalls and discouraging corruption.
- Strengthening the Extractive Industries Transparency Initiative and harmonizing global mandatory revenue reporting mechanisms, given the benefits of such transparency to capital accumulation and broad international security and development objectives.
- Creating an International Regulators Forum, based on similar bodies for sharing best practices in offshore oil safety and medical devices. Doing so would foster investment as well as social protection. The forum should target ministries, specialized government agencies, regulators, transmission system operators, and public utilities to boost capacity and also share best practices in these areas:
    - enabling information and communication among regulators by providing a common website and directory of counterparts;
    - encouraging harmonization of operational standards;
    - sharing best practices for safety (for example, for nuclear power);
    - exchanging regulatory best practices for new processes (such as widespread hydraulic fracturing);
    - organizing training, staff exchange, and on-site training fellowships;

- developing score systems to rate national regulatory capacities and inform investors, insurance providers, and lenders; and
- improving national capabilities to manage fossil fuel windfalls (to minimize corruption, boost transparency, devise contract structures, manage auctions and tenders, etc.).

Pursue coordination at G20 level to establish broad policy principles

Energy policy and economics has come to play an increasingly important role in the G20 agenda in recent years. Its Energy Sustainability Working Group concentrates on four key areas: phasing out inefficient subsidies for fossil fuels, improving energy efficiency, expanding renewables, and promoting energy access. Forging a common agenda among such a diverse group can be difficult. Still, the Task Force believes the G20 provides a key overarching coordination mechanism, to the degree that it is the only forum where heads of state and government discuss a broad array of energy policy issues on a multilateral basis.

- The US should seek to leverage the G20 forum to promote consensus by pursuing agreement on broad principles at the head of state and government level among the G20 and to set a common agenda for the IEA, multinational financial institutions, Paris Agreement implementation, the UN, and others.

Support IEA reform

The IEA is the primary existing international forum for energy policy discussion and coordination. The old formulation of energy producers versus energy consumers is increasingly obsolete, and the IEA itself should reflect that reality. The Task Force recognizes and commends the significant progress being made on reform by the current IEA leadership. In particular, the IEA under its current leadership has worked to expand its Association program of partners, moved forward on Mexican candidacy for membership, and forged deeper links with China.

The Task Force believes that continuing reform of the IEA should include the following elements:

- Supporting IEA core missions of oil security and the provision of timely data.
- Supporting expansion to natural gas security and, where possible, deepening its ability to assess and counsel non-IEA members. The current IEA mandate in the area of gas security is new and should be elevated to the importance of oil security in the agency's work.
- Supporting IEA efforts to draw China and others into the Coordinated Emergency Response Mechanism (CERM) process for emergency oil stock draw, especially as the US plans to sell off volumes from its strategic petroleum reserves (SPR). China is currently involved in emergency response coordination, but is not formally a member of the CERM process.
- Further expanding IEA Association members, with the possibility of introducing a path to membership. Recent additions like Singapore are commendable.
- Conducting a formal legal assessment by the Department of State of how to remove OECD membership as a prerequisite for IEA membership. This requirement has proven to be a key sticking point in terms of maintaining IEA relevancy. The Association program is a good intermediary step, but full membership would be a valuable prospect for some of the most important non-OECD countries, and that is highly unlikely under the current rules.
- Encouraging the expansion of capacity to oversee national statistical processes and capabilities, and to assess those processes and verify reporting. Currently, national data are provided to the IEA and also to the Joint Organisations Data Initiative (JODI), but the collection process and accuracy of national data are highly variable. Regular assessments of national data collection, including in-country visits and recommendations for improvement, would be valuable for increasing market transparency and stability.

Challenges: While IEA reform is important, it is also necessary to recognize the limitations of the IEA and its mandate. More fundamental IEA reform, requiring changing the founding treaties, would require an inordinate amount of political capital at a time of significant political uncertainty globally. The Task Force believes significant elements of IEA reform, including potentially membership requirements, can take place absent any treaty change.

Promote good governance in light of the nuclear power renaissance

A concentrated nuclear power renaissance is seeing the rapid expansion of nuclear capacity in a few countries, and in China and India in particular. Around 60 power reactors are under construction today,

with another 160 planned to come online in the next decade, and twenty-five countries are considering or planning construction of their first-ever nuclear plant (according to the World Nuclear Association).[3]

The growing nuclear club raises issues of quality regulators in a sector where safety and public risk perceptions are key to the industry's prosperity. Fukushima and other nuclear incidents highlight the very high sensitivity of nuclear acceptance worldwide with respect to failures in any part of the world.

The Task Force supports the following measures to promote good nuclear governance:

- Promoting the World Association of Nuclear Operators, based on the INPO model, to provide intra-industry support to regulators for nuclear safety, and the Nuclear Energy Agency for information sharing within the OECD and further afield.
- Expanding IAEA seminars aimed at integrating and informing potential nuclear newcomers to include formal exchanges of regulators and policy makers and foreign placements for experts within budding national nuclear agencies.
- Expanding the IAEA technology program to support the development of new and safer small modular reactor (SMR) technologies. The US Department of Energy's SMR Licensing Technical Support program and Advanced SMR Research and Development program can serve as models to promote SMR deployment on a multilateral basis.

Promote efficient and functional oil markets

The oil market is undergoing significant changes that pose the risk of increased price volatility in the future, thanks to changing elasticities and stickiness of supply, as well as elasticity of demand. Sharp and rapid fluctuations in the oil price can have serious effects on companies, economies, and global geopolitics. Price spikes can curb economic growth, while a sudden fall can negatively impact the oil industry and associated jobs.[4]

Despite the dangers of introducing market inefficiency, it is important to recognize the ongoing political imperative to limit price fluctuations in the market. Governments are not in a position to stop price fluctuations, short of adopting extreme measures and implementing the use of force. However, because of political pressure, improper solutions can often seem tempting. The Task Force cautions against any calls to sue OPEC, blame speculators, or discourage hedging.

Instead, efforts should focus on promoting functioning markets and efficiency. To that end, the Task Force supports the following measures:

- Improving market transparency and efficiency by providing complete and reliable data. JODI is only as effective as the data provided by national authorities, and there should be a concerted effort to encourage full and accurate disclosure by all participants, including China.
- Ensuring transparency by providing meaningful analysis of price dynamics and other market information. Working-level cooperation between the IEA, IEF, and OPEC, together with the International Organization of Securities Commissions, has produced important findings on oil price formation since 2011. Such joint collaboration can set the analytical standard for industry and markets and temper market reaction to uncertainty. Such collaboration should be expanded.
- Conducting a review of more flexible uses of the SPR, including regional product stockholding for acute local shortages and a filling cycle linked to market forecasts. There has been much discussion about the changing nature and purpose of the SPR. It is true that using such stocks for regular price manipulation is ineffective and risky due to their limited volumes and slow response time, and the "powder should be kept dry" only for acute physical supply shortages. However, in some limited cases greater flexibility could render the SPR more effective.

Mobilize financing for necessary investments in line with policy aims

Energy policy is ultimately implemented primarily in terms of what is and is not built on the ground. Public institutions can facilitate those investments in more or less direct ways, from regulatory policy to direct provision of financing or even public construction. The existing international energy governance framework can sometimes reveal a disconnect between international energy policy formation, and

3 "Plans for Reactors Worldwide," World Nuclear Association, Updated February 2017, http://www.world-nuclear.org/information-library/current-and-future-generation/plans-for-new-reactors-worldwide.aspx.

4 "Oil Price Volatility: Causes, Effects, and Policy Implications," Council on Foreign Relations, June 2016, http://www.cfr.org/global/oil-price-volatility-causes-effects-policy-implications/p37946.

A worker walks through the installed solar modules at the Naini solar power plant in the northern Indian city of Allahabad March 21, 2012. *Photo credit*: Reuters/Jitendra Prakash.

the interests that guide credit provision or investments by infrastructure banks or other MFIs. New models, such as the China-led AIIB, may be more effective in implementing an international energy infrastructure policy agenda and compete with US interests. At the same time, the United States must recognize that government does not always set the agenda, even less so in the age of high technology. Processes, therefore, need to be more iterative and inclusive of commercial and civil society elements.

The Task Force therefore supports improving coordination between policy shops and implementation agencies, working with the private sector to devise appropriate tools, and expanding infrastructure financing by doing the following:

- Providing technology/system integration training and support to financial institutions themselves (through the IEA, IRENA, or others).
- Working with the private sector to identify "key enablers" such as domestic credit accessibility or risk mitigation measures to address investment bottlenecks for energy poverty, green technology, and energy security.
- Encouraging the World Bank, European Investment Bank, Asian Development Bank, European Bank for Reconstruction and Development, and other MFIs to broaden their lenses to natural gas and national structural reform. Even digitization and process support can help countries improve energy security and increase diversification, including the facilitation of renewables and energy efficiency.

Mainstream climate and energy issues into conflict prevention and management

Mainstreaming energy security issues into the international community's conflict prevention and management efforts is imperative.

- The UN Secretariat should factor energy security issues into its policy planning, and the entire UN system should be empowered to systematically engage with a global network of key actors in

the energy space: member state governments, other international organizations, private sector stakeholders, academia and think tanks, and civil society.

- NATO has been considering energy security since 2006 and has included an Energy Security division at its Brussels headquarters since 2009. This division serves primarily as a talking shop. Details of international energy logistics chains and their critical infrastructures should be translated into regular risk assessments and incorporated into military planning exercises. Training in critical infrastructure protection should support domestic security efforts in non-member producer and transit countries.

Promote energy efficiency more vigorously

Energy efficiency benefits a wide range of sectors, and often at much lower cost than the construction of new capacity. This is especially important for energy-poor countries where advances in efficiency can be less costly than new generation.

While still under the UN aegis, SE4All (Sustainable Energy for All) set a goal of doubling the global efficiency improvement rate by 2030, and the IEA has been active in providing efficiency roadmaps and recommendations to national policy makers. Recent efforts to deliver on the G20's energy efficiency agenda and IPEEC's renewed outreach to partners and stakeholders are commendable.

- IPEEC and others in the international energy efficiency community should work closely with private sector actors, and particularly commercial banks and insurers. Novel for-profit programs to improve consumer efficiency could shift the risk burden and investment costs from individuals to institutions and facilitate widespread take-up.
- MFIs should be encouraged to make energy efficiency (particularly in the industrial sector) a major pillar of their investments, financing, and technical assistance programs.

Improve energy access and reduce energy poverty

Alleviating energy poverty has been recognized in the Task Force findings as a key goal of international energy governance, and one that directly serves US interests.

- Micro-grid solutions can be more reliable and cheaper than national grid expansion. They also have major economic multiplier effects, enabling village-level ICT and rudimentary financial market access. The US, the IEA, and MFIs should work with leading private sector micro-grid providers and local regulators to assure smooth access in local conditions.
- Multilateral and bilateral institutions need to use their tools to leverage private sector investment, and to promote functional and replicable business models.[5] They can also provide low-cost solutions to reduce political and regulatory risk for the private sector.
- Direct funding may be necessary in those areas that do not offer an initial commercial return. Provision of end-user finance is required to overcome the initial capital cost. Innovative microfinance methods and institutions can provide that finance, and also help facilitate regular service payments, for example, through local networks. In addition, seeding privately run venture funds in regions can encourage local power start-ups.

5 "Financing Energy Access," International Energy Agency, http://www.worldenergyoutlook.org/resources/energydevelopment/energyforallfinancingaccessforthepoor/.

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