



## SUMMARY: ROUNDTABLE ON ENERGY AND ECONOMIC DIVERSIFICATION POLICIES

*Final report prepared by*

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“Summary: Roundtable on Energy and Economic Diversification Policies”

Transcription of the proceedings completed by Shih Yu (Elsie) Hung and Anna Mikulska

## I. Introduction

The Center for Energy Studies (CES) at Rice University's Baker Institute for Public Policy and the Qatar Leadership Centre hosted a roundtable February 15-16, 2017, in Doha to discuss some of the most pressing challenges facing market participants in the global energy landscape, with a focus on several issues of paramount interest to Qatar and the broader Gulf Cooperation Council (GCC). The two-day event began with introductory remarks by H.E. Dr. Abdulla bin Ali Al-Thani, Managing Director of the Qatar Leadership Centre. He welcomed the delegation and shared the hope that the two-day event would lead to important dialogue that could create a solid foundation for future collaborations and meaningful policy.

Following the introduction, opening keynote remarks were given by Qatar's Minister of Energy and Industry, H.E. Dr. Mohammed Al Sada. Minister Al Sada's remarks underscored the pivotal role of the energy industry for the development of the global economy. He expressed an expectation that growth in global demand for natural gas will be a hallmark of the next two decades, and that oil will continue to hold significant importance as a primary global energy source at least into the 2040s. He noted the regional importance of this, as the energy industry has been particularly significant for the GCC countries where oil and gas production has dramatically transformed local economies, impacted social development, and generally improved standards of living in a relatively short time. He highlighted that GCC states will continue to energize the global economy and be vital for global energy security.

The Minister also recognized that the 2008 economic crisis and the precipitous decline in oil prices since 2014 dramatically impacted the energy industry and presented some particularly difficult times for energy-producing countries. He also emphasized that these developments have also coincided with negative economic events—such as increased unemployment and economic recession—in other countries around the world, including the world's largest energy-importing nations. He then noted that there are no winners from this most recent oil price drop, and that a healthy oil industry is a barometer for a healthy global economy. Accordingly, it is important that producers and consumers share perspectives and engage in transparent dialogues, like those facilitated by the International Energy Forum. Doing so could foster a balanced approach toward improving energy security and the environment—for instance, by promoting both energy efficiency and renewable energy development.

Minister Al Sada then highlighted Qatar's active role in these efforts, elevated in 2016 by the country's leadership roles in both OPEC and the Gas Exporting Countries Forum. Qatar has been exceptionally successful in building common ground for dialogues between producers within and outside OPEC, including the historic OPEC resolution to cut production and the subsequent agreement of 11 non-OPEC producers to follow suit.

While the fall in oil prices and global economic slowdown have presented challenges, they have also opened windows of opportunity for economic and energy diversification. Qatar

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captured this opportunity with effective investment policy and by increasing efficiency in production while reducing cost. These productivity gains have set the stage for Qatar to maintain a position of energy leadership in the coming years. The country's hydrocarbon industry has been a pioneer in driving investment in world-class infrastructure, efficient public services, highly skilled labor, and expanded innovation capabilities. In addition, economic diversification efforts have resulted in the strong performance of non-hydrocarbon sectors—including construction, financial services, and insurance services—that help maintain Qatar's healthy GDP growth and have cushioned the country's economy from the impact of the oil price drop.

Following the remarks of Minister Al Sada, the Director of the Baker Institute for Public Policy, Ambassador Edward P. Djerejian, and the President of Qatar University, Dr. Hassan Al Derham, each offered short statements. They each praised the partnership between the Qatar Leadership Centre and Rice University's Baker Institute for Public Policy and underscored the standing of these institutions as global centers for excellence in public policy research on the issues of energy, sustainability, health care, and migration. Dr. Al Derham also shared his vision that Qatar University is uniquely positioned to play an important role in helping to facilitate the growth of the knowledge-based economy in oil- and gas-producing countries. Thus, Qatar University is focused on developing a sense of ethical and social responsibility and adaptability. He then highlighted that collaboration with industry and think tanks such as the Baker Institute is crucial to achieving this goal.

After the opening session concluded, the delegation moved into four consecutive panel discussions—two on Wednesday, February 15, followed by two on Thursday, February 16—held under Chatham House Rules to promote open and clear dialogue on a series of important issues facing the broader global and regional economies and the linkages to the energy sector. The panels, in order, were organized as follows:

- Panel 1. Energy Subsidy Reform
- Panel 2. Economic Diversification in Energy-Exporting Nations
- Panel 3. The Energy-Food-Water Nexus
- Panel 4. Climate Change

The conference concluded with a session open for attribution in which remarks were offered by H.E. Abdullah bin Hamad Al Attiyah, former Minister of Energy and Deputy Prime Minister; Dr. Kenneth B. Medlock III, CES Director; and Sheikh Faisal bin Fahad Al Thani, Deputy Managing Director of Maersk Oil.

## II. Chatham House Rules Panel Discussions

### A. Panel I: Energy Subsidy Reform

- i. Session facilitated by Sheikh Mishal Al Thani, Director, Energy Affairs, Ministry of Energy and Industry
- ii. Presentation to open discussions given by Dr. Jim Krane, Wallace S. Wilson Fellow for Energy Studies, and Dr. Francisco Monaldi, Fellow in Latin American Energy Policy, Rice University's Baker Institute for Public Policy

The first panel of the day focused on energy subsidy reform. Specifically, the discussion examined the implications of energy price subsidies in Middle Eastern energy-exporting states. To the extent that subsidies encourage high levels of domestic consumption of oil and gas, which are primary export commodities, some countries may find themselves forced to reduce exports. This, in turn, presents a dilemma. Thus, policymakers must find ways to reduce direct energy subsidies without undermining domestic political support. There are various approaches to accomplishing this, including a Hicksian bargain, but the matter is far from simple, as subsidies are often considered to be “entitlements” of citizenship.

The presentation outlined an economic perspective on the issue of domestic energy price subsidies, and underscored the overwhelming consensus among economists that fuel subsidies are inefficient and regressive. In fact, the practice of subsidizing transportation fuels is diametrically opposed to a policy of imposing taxes, a practice that economists often suggest on consumption that generates negative externalities. In the case of transport fuels, literature has estimated that these externalities—including local air pollution, greenhouse gas (GHG) emissions, traffic congestion, and accidents—may reach an equivalent of more than \$100 per barrel in total cost.

Despite this, countries across the broader Middle East and North Africa (MENA) region remain among the highest subsidizers of petroleum products in the world. Of note is the fact that these subsidies are often higher than social spending on education and health, meaning the distribution of fuel wealth is an important part of the social contract between leadership and citizenry in these nations. Nevertheless, subsidizing domestic energy consumption reduces the fiscal capacity of national oil companies to invest, thereby limiting their ability to diversify their asset base. In addition, subsidies heighten the impacts of cyclical in oil markets, as export revenue streams face exposure to price risk whereas domestic consumption is largely non-responsive because domestic consumers are shielded from price movements. However, reducing subsidies is politically difficult. In absolute terms, subsidies are considered important for the poor, and the general population often perceives them as a means to share in the domestic oil wealth.

The discussion then turned to the politics of subsidy reform in the GCC. It was noted that low oil prices were useful as political cover for current reform efforts, but subsidy reform is, in reality, based on deep economic concerns. Data were presented showing that current subsidy reform efforts have raised the prices of electricity in countries such as Qatar, Kuwait, and Saudi Arabia, and of transportation fuels in all countries across the GCC (except in the

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United Arab Emirates [UAE], where prices were already fixed at a relatively high level). Thus, the question then arises, how are higher energy prices politically and socially acceptable? It was argued that four primary factors have enabled reforms to proceed:

- First, fiscal pressures in the GCC countries have been pivotal, as steep reductions in oil revenue created pressure to reduce state spending. The expectation of continued low oil prices enabled policy corrections, with younger leadership in Saudi Arabia, Qatar, and the UAE welcoming the opportunity to mitigate some of the distorting effects of subsidies.
- Second, subsidies have been a significant driver of domestic demand, diverting otherwise exportable oil and gas into the domestic market. Going forward, this would have inevitable implications for government revenues and the ability to finance social benefits and put pressure on long-standing political structures and practices in the region.
- Third, GCC countries have experienced substantial external pressure from organizations such as the Organisation for Economic Co-operation and Development (OECD), the International Monetary Fund, the Asia-Pacific Economic Cooperation, the World Bank, the International Energy Agency, and the G-20. Concerns over climate change have been a particularly important factor in garnering support for subsidy reform, as it has provided political cover and allowed leadership to deflect blame.
- Lastly, regional unrest and post-Arab Spring chaos have been reshaping state-society relations. As citizens become more concerned with internal stability—of which ruling sheikhs are the best guarantors—a new social contract emerges. For example, one survey among Kuwait's population showed only one-third of those surveyed were actively opposed to paying higher energy prices, even when compensating mechanisms to maintain stability are offered.

In concluding the session's opening presentation, it was noted that current reforms in GCC countries have been more successful than, for example, reforms in Dubai in 2010-2011 that had to be rolled back due to the Arab Spring and a general lack of support. In contrast, current subsidy reforms have achieved reductions in diesel and electricity demand in Saudi Arabia and a decline in fuel demand in Oman. Therefore, it may be time to reassess the theories that argue that such reforms are a violation of the social contract. Moreover, given the recent successes, one can reasonably expect more reforms in the future, including in Saudi Arabia where calls can be heard for full rationalization and recasting of subsidies as cash benefits for citizens based on their income level.

During the question and answer (Q&A) period, questions from the audience ranged from very detailed—such as addressing the specifics of the UAE's subsidy reforms in 2010-2011—to more general in nature, including the concept of the social contract and the role of universities in the region to help shape discussions about subsidy reform. In addition, some audience participants raised questions about the role of energy efficiency and how energy efficiency mandates and directed policies could either replace or supplement subsidy reform measures.

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In reply, it was noted that many Gulf countries have already been making efforts to improve energy efficiency—including new standards for appliances and air conditioning, and building codes that require insulation. But it was generally agreed that a real price signal is needed to rationalize consumption and incentivize more efficient investment, thereby reducing waste and inefficiency. The example of Oman was raised, where efficiency gains were realized following the imposition of a shadow price on natural gas of \$5 per thousand cubic feet (mcf). Additional efficiency measures to consider include time-of-day pricing that signals consumers to reduce load when demand spikes, and the adoption of various demand response and “smart” technologies. Indeed, such moves would be broadly consistent with efforts to transition to a “knowledge-based” economy, where data services are integrated deeply with the delivery and use of energy services.

The experience in the US was then offered as an example of the importance of approaching greater efficiency in the delivery of energy services—both production and consumption—through multiple pathways. In the US, the liberalization of electricity markets pushed companies to diversify their portfolios and offer new services to maintain competitiveness. This includes services and technologies ranging from flexibility in choosing what form of generation to contract, to enhanced efficiency through smart thermostats and real-time pricing.

For the case of Qatar, one audience participant suggested shifting transport fuels toward natural gas while not subsidizing the latter. However, it was cautioned that such a move would not be effective if gasoline remained highly subsidized. Rather, removing subsidies on gasoline and compensating citizens with other benefits can achieve better pricing and incentivize a more appropriate allocation of resources.

One of the presenters pointed out that survey research in Kuwait has suggested that people would not mind paying more if there was sufficient transparency regarding the allocation of revenues by the government. However, responding to a concern that subsidy reforms may be disruptive to society, he also noted that what is deemed permissible can vary from country to country.

Noting the fact that countries are indeed different, the audience participants also stated the “ruling bargain” should be addressed. OPEC member states such as Venezuela need reform much more than any of the GCC countries, and the ruling bargain plays a crucial role in subsidy reforms regardless of regime. Indeed, this highlights the role of timing in adopting reforms—namely, that it may be less feasible to engage in reform when social and fiscal stresses have already reached a boiling point, and more feasible beforehand. The presenters each stressed that the issue of subsidy reform is politically sensitive and complex, so no one path will necessarily work universally. But this does not deny the underlying theme that reform, if done appropriately, can yield considerable benefit. They then pointed to Norway as the best example of an oil and gas producer that does not subsidize energy consumption but taxes it instead. While eliminating subsidies and instituting taxes is not the likely path for GCC countries, as it raises issues around taxation without representation, the case of Norway does highlight an alternative path that

stimulates greater efficiency along the entire energy value chain and can be used as a model for redirecting sovereign wealth with the aim of improving the welfare of current and future generations.

**B. Panel 2: Economic Diversification in Energy-Exporting Nations**

- i. Session facilitated by Dr. Ali Ammari, Counselor for Economy and Finance, Prime Minister's Office**
- ii. Presentation to open discussions given by Dr. Jim Krane, Wallace S. Wilson Fellow for Energy Studies; Dr. Francisco Monaldi, Fellow in Latin American Energy Policy; and Mr. Joe Barnes, Bonner Means Baker Fellow, Rice University's Baker Institute for Public Policy**

The second panel of the day focused on strategic economic diversification in the GCC states. Speakers mapped the existing landscape of diversification initiatives in the region and identified strategic pathways going forward. The countries of the GCC, in particular, are well positioned to provide an important stimulus for long-term global economic growth due to their relative abundance of energy resources and their advantageous geographic location that makes them an important trading hub between the East and the West. Indeed, the latter point has a long history of economic relevance. However, the region's instability carries broad geopolitical repercussions that undermine development, and an inward look at various economic policies could pave the way to a more stable future. Among the issues on the table for this panel were:

- regional demographics, trends in population growth and unemployment, and the potential for expanded employment opportunities;
- regional industrial policies and their contributions to intraregional cooperation and/or competition;
- the relevance of the "resource curse" and the potential for economic diversification; and
- the return on higher education efforts in the region and workforce migration.

The panel opened with a review of literature on economic diversification in hydrocarbon-dependent countries and the challenges the GCC region faces. It was pointed out that until recently, the research lacked country-specific analyses, so one must look to broad lessons for applicability. The GCC region is unique even within the MENA region, given the abundance of hydrocarbons and member countries' dependence on oil and gas exports as a major source of revenue (over 60% of GDP, over 80% of exports, and over 80% of government revenues). Additionally, GCC countries are unique in their need to import labor and the high participation of expatriates in the local labor market. Collectively, these characteristics make GCC countries' revenues vulnerable to price volatility, and render their economic well-being susceptible to the problems associated with Dutch disease.

Most countries have attempted to diversify their industrial base by subsidizing downstream, such as energy-intensive industries like petrochemicals. However, it was argued that this is not a deep diversification, since it does not reach far beyond the oil and

gas sector. In addition, if done incorrectly, it may redistribute rents to producers instead of developing a healthy, globally competitive industry.

It was stressed that price volatility, as well as significant exposure to global demand and supply factors, poses a particular challenge for long-term stable growth. Indeed, if investors perceive a concern about heightened risks due to overreliance on one sector, foreign investment can be challenged as it may require higher rates of return. Moreover, as was pointed out in the previous panel, oil-producing countries tend to elevate exposure to risk associated with price volatility and dampen revenue-generating upside by implementing policies such as subsidies.

The economic reasons for promoting diversification that were pointed out in the presentation include risk diffusion, stabilizing GDP growth, and avoiding potential obsolescence of hydrocarbon resources due to technological innovation or global climate change policy. It was also noted that asset diversification, rather than diversifying the nation's economic structure, is a potential alternative strategy. Such a path might involve building a sovereign wealth fund (SWF), though this option raises complex questions of benefit distribution and fund management. Along these lines, the initial public offering of Saudi Aramco is an example of asset diversification that puts an immediately monetizable value on Saudi Arabia's massive resources that can be leverage into broader, structural economic diversification efforts.

The presentation then delved into plans that GCC countries have drawn up to enact diversification strategies. The presentation underscored that these typically ambitious and multi-decade plans often include buzzwords such as "knowledge-based," "social development," and "human capital," and often appear to be written to appeal not only to the citizens who question the status quo but also to foreign investors. It was then pointed out that while different countries have varying motivations for their proposed reforms, their plans share generally similar features. They all intend to create knowledge-based economies where growth is driven by research and development and high value-added sectors. The plans also emphasize expanding and strengthening private sector activities and creating jobs for citizens to absorb the fast-growing and well-qualified young population entering the labor market. Notably, all these plans have external origins, drawn up mainly by foreign consultants. In some cases, the plans even share similar language.

The presenters highlighted a lack of political awareness in these plans. Trade-offs that diversification reforms generate would require policymakers to address deep-rooted entitlements behind certain imbalances, particularly in the labor sector. In addition, the plans do not necessarily address competing interests—for example, the possibility that the private sector, worried about the loss of cheap foreign labor force, would oppose government reform plans to employ citizens. Vested political or economic interests are also not to be ignored, even though a majority of GCC countries lack political pluralism. In practice, opaque politico-economic networks may be more difficult to dislodge than open, formal structures. In sum, the politics of diversification reform are largely absent from the vision statements and are largely left up to local leadership to navigate.

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It was then argued that the success of the diversification plans lies in the development of strategic niches, which position the Gulf states as regional hubs in sector-specific areas characterized by cutting-edge expertise. These niches have already strengthened local cycles of innovation and enterprise and stimulated the growth of non-oil sectors. Dubai was noted as perhaps the best example of a successful, post-oil economy.

The presenters then delved into the broader geopolitical ramifications of economic diversification in the Gulf. It was pointed out that future reforms would occur in the context of high strategic uncertainty resulting from various factors, such as the 2003 invasion of Iraq; the Arab Spring; civil wars in Syria, Iraq, Yemen, and Libya; intensified Iran-Gulf Arab competition; and a new role for Russia in the region involving military intervention. This uncertainty was heightened further by the sense of US disengagement from the region under President Barack Obama, and the uncertainty has not abated with the new US administration. Indeed, the Trump administration's impact in the region is still unfolding—particularly as its primary cabinet and deputy appointments come into full focus—but there is an expectation that the new administration will seek to strengthen relations with GCC countries, particularly with Saudi Arabia.

The presenters concluded their formal remarks with 10 suggestions for successful strategic diversification in the GCC region:

1. Engage with a wide range of stakeholders for a bottom-up and top-down approach to implementing diversification strategies.
2. Take advantage of the “window of opportunity” presented by low oil prices to push through measures that would otherwise have been politically unfeasible.
3. Maintain policymaking fortitude by not permitting mild public disquiet to derail measures vital to putting Gulf economies on a sustainable long-term footing. This will require significant and regular public and special interest engagement.
4. Have the confidence to persevere with sensitive measures and not be deterred by pushback from vested interests.
5. Realize that a successful transformation into a diverse, knowledge-based economy is an intergenerational process involving ongoing structural reform.
6. Consider if and how a young and highly educated populace might become agents of disruptive change if they perceive limits to their abilities to access information and utilize knowledge autonomously.
7. Recognize that reform is interdependent. Failed efforts in one area could jeopardize other reforms.
8. Strengthen the enabling environment through institution building, market development, and establishing conducive legal frameworks.
9. Acknowledge that the economic and political aspects of reform may need to be closely linked. The removal of subsidies, and even the introduction of taxes and fees, may very well change the relationship between citizen and state.
10. Intensify “e” (electronic) and “m” (mobile) government as a way of opening government services, making them more interactive and responsive to citizens.

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Many of the questions that followed the presentation revolved around opportunities for greater regional integration within the GCC. As one participant argued, such integration should be considered particularly important for small countries like Qatar. In response to a call for a more integrated approach where countries specialize while diversifying their economy, an audience participant agreed that regional cooperation and integration allows countries to capture economies of scale in an entrepreneurial economy. Approaching diversification from a regional perspective can benefit the GCC significantly. To highlight the benefit of diversification that was facilitated by greater regional integration, the case of Houston, Texas, was raised. After the oil and gas bust in the mid-1980s and subsequent real estate crisis, economic diversification was achieved through the city's increased regional engagement within Texas, with the US Lower 48, and with Mexico.

Integration was again highlighted as being critical for successful diversification, this time in the electric power sector. The European integrated distribution system for electricity was mentioned to illustrate this point. This system allowed Germany to successfully expand renewable energy by capitalizing on the stable nuclear baseload from France. It was also mentioned that a similar integrated electricity grid would allow trading within the GCC region and perhaps even allow for the export of electricity to neighboring Egypt. In turn, this would deepen the regional electricity market and provide significant opportunities for diversification strategies in the power generation mix.

Building on the theme of the importance of integration, the speakers and audience participants then shared concerns about strategic visions drawn up by foreign consultants in isolation from each other. Examples of failure and success were each highlighted: the failed RAND education reform in Qatar, and the successful Dubai Internet City proposed by an outside consultancy that brought substantial foreign investment to Dubai's economy. As a result, caution was expressed, but so was the sentiment that such strategic visions may stand a better chance of success if approached in a regionally integrated manner rather than in isolation.

Participants generally agreed detailed plans that identify specific sectors for diversification, as opposed to high-level policies, are the key to success. Also, participants noted that it is important to include all risks in the objective of diversification, such as resource obsolescence, price volatility, and local employment. For Qatar, asset diversification was identified as important, given the country's significant financial resources. Establishing a well-diversified SWF could generate more stable returns than the hydrocarbon industry. Of course, this involves solving complex issues such as long-term fund management, the establishment of institutions for effectiveness and credibility, and the development of strategies to execute policies using the returns from such a fund.

Prior to wrapping up the Q&A, a participant noted that the national plans tended to focus on strategies and high-level challenges without providing practical solutions. Therefore, it was argued that a reassessment of the plans is likely needed. The plans often lack effective strategies that would attract foreign investment, which GCC countries both need and want in order to successfully diversify. It was generally agreed that diversification leads to

stability and economic growth. As evidence of this, one audience participant noted that Qatar's diversification efforts contributed to positive economic growth despite the low oil prices over the last two years.

**C. Panel 3: The Energy-Food-Water Nexus**

- i. Session facilitated by Mr. Ali Al-Rahbi, Chief Operating Officer Upstream, Dolphin Energy**
- ii. Presentation to open discussions given by Mr. Gabriel Collins, J.D., Baker Botts Fellow in Energy & Environmental Regulatory Affairs, Rice University's Baker Institute for Public Policy**

The third panel of the conference included a presentation on the energy-food-water nexus in the Gulf region. Energy, food, and water are the three pillars upon which civilization rests, and each is inextricably tied to the other. Continued improvement of the welfare and advancement of civilization depends on this interlinked foundation. Yet despite a universal need for all three pillars to remain strong, the linkages between energy, food, and water take on different meanings in different parts of the world. Many countries of the Middle East have a relative abundance of energy resources yet are almost entirely import-dependent on food, and freshwater resources are scarce. In the US, however, the dynamics are different, as they are in Europe, Africa, and Asia. Accordingly, the political, cultural, technological, and economic challenges faced in the Middle East and around the world in relation to water, food, and energy security need to be better understood if the stresses in the nexus are to be sustainably addressed.

To open the panel, the moderator stressed the complex interaction between water, energy, and food, all of which are essential for human well-being and sustainable development. He also noted that environmental stress and, in some cases, resource scarcity are generally expected to increase in the future, making the nexus more important than ever.

The presentation that followed derived from an economic framework that can be used to analyze both energy security as well as food and water security. This framework was used to identify why differences in the nexus exist from country to country. It can also be used to analyze the sustainability of certain portfolios.

To begin, stresses in the food-water-energy nexus exist in various dimensions across all areas of the world. In the Gulf region, three countries in distinct situations can be highlighted to annotate different approaches:

1. Iran has a large population, faces water scarcity, and pursues food supply autarky.
2. Saudi Arabia has a medium-sized population, faces water scarcity, and once pursued greater domestic food production, but has since responded to climate and hydrological realities.
3. Qatar has a small population, faces water scarcity, is wealthy, and pursues a diversified food security portfolio.

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The different approaches Saudi Arabia and Iran have taken toward wheat production were highlighted. Both countries have suffered a dramatic decline in their aquifers due to overuse of groundwater for wheat irrigation. This decline pushed Saudi Arabia to halt subsidy payments for wheat cultivation, but Iran continues to pursue wheat cultivation at the same level. Iran's position is driven by several factors, including the influence of powerful domestic vested interests, a structure of ownership based on a large group of small stakeholders, high domestic agriculture-based employment (20%), and concern about political instability fueled by a food crisis. In addition, a dramatic increase in yield for irrigated crops versus rain-fed wheat cultivation has incentivized farmers to pump their private tube wells and thereby overuse groundwater, which is a common issue when addressing a non-priced resource. Heavily subsidized electricity and diesel use encourage even greater levels of water withdrawals and consumption, which only exacerbate the issue. In effect, Iran is experiencing what is known as the tragedy of the commons—water resources are being over-used relative to their collective values due to individual behaviors that are oblivious to the larger implications.

The presenter then underscored the significant amount of electricity used for water extraction to cultivate wheat in the Gulf. Electricity intensity increases with the use of deep groundwater or desalinated water. Since most of Gulf countries' electricity is generated from fossil fuels, electricity used domestically reduces the exportable supply of oil and gas. The panelist posited an extreme hypothetical example where Iran uses desalinated water to grow wheat. Initial modeling results imply that desalinated water would irrigate 10% of Iran's wheat supply at the cost of 14 million tonnes of liquefied natural gas (LNG) per year. The analysis put the "social cost" of the experiment at over \$2,500/tonne.

Qatar is in a much different position, given its small population and much higher financial resources per capita. Like Saudi Arabia, Qatar can import grain whenever needed and avoid food security issues that are usually driven by a lack of economically accessible food commodities. The panelist pointed out that concerns of Saudi Arabia and Iran over a potential embargo or sanctions on trade in agricultural commodities should not be overblown, particularly because global agriculture is very diversified and US action alone is unlikely to have much of an impact on global supply.

As an alternative to importing grain from abroad, it was posited that Gulf agricultural producers could also use less water. Water users respond to high prices. Thus, pricing water as a scarce resource may be worth considering as part of a broader food security strategy, of course recognizing the political sensitivity of such a measure. Another tactic would be to increase storage capacity for grains, especially since closure of the Strait of Hormuz—as unlikely as it may be—could dramatically disrupt the supply of agricultural commodities going to places like Qatar. Storage effectively raises the short-run elasticity of supply by facilitating an incremental addition to the overall supply portfolio in times of need. Food storage, of course, would have to be managed by filling and then cycling the inventory to avoid decay, but such a management practice is not groundbreaking.

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The discussion then turned to Qatar's deployment of financial resources to address food security issues, including the practices of Hassad Food, which has been investing in wheat and meat producing assets in Australia. By investing directly in the agricultural "upstream," Hassad Food is adding to the fungibility of global foodstuffs, which in turn enhances food security on a global scale. Qatar is also improving its food security through investments spearheaded by the Qatar Investment Authority in various professional farm management companies, such as Adecoagro. Such a strategy enhances investment in agricultural production, thereby serving to further enhance fungibility in foodstuffs. But these assets also provide a hedge against unanticipated food price movements and, more generally, serve as a general move toward asset diversification. Such a strategy does not solely serve the interest of food security, because some assets yield surprisingly high returns. For instance, Adecoagro's earnings before interest, taxes, depreciation, and amortization (EBITDA) margins for sugar, ethanol, and energy were higher than those of Google in the recent past.

The presentation concluded with a reiteration of the opportunities capital investment in agricultural commodities around the world brings in terms of (a) diversifying the country's asset base away from the oil and gas sector, (b) providing a hedge against food security concerns, and (c) delivering robust financial returns.

In the Q&A period, the importance of foreign investment for ensuring food security both in Qatar and across the region was reiterated. When discussing potential target areas for investment, it was noted that certain markets might be more expensive to enter but safer for investment than others. For example, Australia, the EU, the US, and Canada offer the greatest legal protections. Meanwhile, emerging markets like Sudan or Pakistan carry both higher costs required for establishing agricultural infrastructure and—due to existing legal frameworks—higher risk associated with possible trade interdiction in the future.

When asked about challenges to food security such as domestic regulation, lack of operational experience, and lack of control of the value chain, the presenter highlighted the role of foreign investment in minimizing risks. It was also suggested that, for example, a lack of operational experience could be addressed through foreign expertise. Through foreign investment in agricultural production, Qatar is better situated to garner long-term benefits from engaging with local counsel and government (for instance, lobbying). However, it was noted that establishing such "soft power" through this means might take a long time. Thus, the importance of creating a supportive local constituency for foreign investment was stressed, but such efforts should not create the perception of "land grabbing" if public support is desired. Outside investors with a long-term commitment may be highly beneficial, as they could bring in much-needed infrastructure investment, and their own profit motives could help to ensure stability in the water supply.

An audience participant raised a question about the impact of climate change and the disruption it may cause in food supply—particularly for a region that relies heavily on imported food—and how that plays into the concept of asset diversification. It was agreed that climate change could have disproportionate impacts on certain food markets, which

enhances the need for diversifying overseas grain supply. However, food cannot be the only option of asset diversification. In fact, strategic investments in equity and bond markets via an SWF, combined with acquisitions of food assets, would ensure food and economic security in the long run.

The costs of energy and water were also discussed. One audience participant argued that the know-how in addressing the challenges in the nexus might be more important than the costs of addressing them. In response, it was noted that trade-offs are at the center of the energy-food-water nexus. Fundamental economics can be overwritten by domestic political calculations, although doing so jeopardizes the sustainability of the nexus. When subsequently asked about the costs and competitiveness of treated wastewater as opposed to desalination, it was pointed out that the lower energy intensity of this resource compared to desalination makes it attractive on balance. However, its competitiveness would depend on specific political decisions, as well as on the agricultural options chosen.

**D. Panel 4: Climate Change**

- i. Session facilitated by Dr. Ali Hamed Al-Mulla, Assistant Secretary General, Gulf Organization for Industrial Consulting**
- ii. Presentation to open discussions given by Dr. Kenneth B. Medlock III, James A. Baker, III, and Susan G. Baker Fellow in Energy and Resource Economics and Senior Director, Center for Energy Studies, Rice University's Baker Institute for Public Policy**

The fourth panel of the conference considered climate change and explored the grand energy challenge—namely, how environmental and economic sustainability can be maintained while ensuring ever-improving standards of living. Of particular relevance for this discussion are the implications of climate change policies for energy markets and energy-exporting nations. The landmark agreement reached at the 2015 United Nations Climate Change Conference in Paris set a long-term goal of a carbon-neutral world by 2050. It established a paradigm for countries to voluntarily contribute to global reductions in GHG emissions and offered a framework for developing countries to finance adaptation measures through assistance from developed nations. This places Qatar at a crossroads, because the state's economy is heavily dependent on the hydrocarbon extraction and transformation industries. Given that carbon-based fuels are being targeted for reduction, how will Qatar's reliance on the hydrocarbon sector intersect with the goal of a global low-carbon future?

The panel opened with the moderator briefly discussing Qatar's initiatives in mitigating climate change and efforts to expand the use of technologies for carbon capture and storage (CCS). This set a tone for the presentation that followed, which highlighted some important points. First, there is no "silver bullet" when addressing climate change. A concerted focus on the reduction of hydrocarbon fuels is a potential pathway. However, it is challenged by the fact that those fuels represent a large incumbent position in a very capital-intensive global energy market, and those fuels are still relatively inexpensive. Thus, unseating their position in a rapid manner will not come without cost.

Second, the issue of energy poverty, which is the lack of access to modern energy services, cannot be ignored in the interest of mitigating the combustion of hydrocarbon fuels. Over one billion people around the world suffer from such abject poverty that they have no reliable access to electricity, running water, or fuels for heating and cooking. Raising the standards of living of these individuals will serve multiple goals associated with broader economic development. Importantly, addressing their struggle is paramount for regional and global economic and social stability.

Third, technological innovation is important in addressing the challenges before us. As such, it is important that resources be allocated to developing technologies that mitigate the release of carbon dioxide (CO<sub>2</sub>) into the atmosphere. They can be related to CCS, to any number of non-hydrocarbon-based energy sources, and/or to means of mitigating the release of other GHGs. In sum, a more holistic approach to the portfolio of energy technologies and resources is needed for realistic and achievable solutions.

The presentation began by noting that the current focus on CO<sub>2</sub> levels in the atmosphere is not enough. A portfolio approach is needed to include other GHGs such as nitrous oxide (N<sub>2</sub>O), which is 300 times more potent than CO<sub>2</sub> but is omitted in most discussions about climate change mitigation that tend to focus on CO<sub>2</sub> equivalents, thereby rendering the addressing of solutions almost exclusively toward CO<sub>2</sub>. Interestingly, the primary emitter of N<sub>2</sub>O is the agricultural sector, which highlights yet another linkage in the food-energy-water nexus. There are technologies that can serve to mitigate N<sub>2</sub>O release; however, policy has not actively addressed their implementation, which may be needed if a more holistic approach to GHG reduction is taken.

The current environmental push toward renewable energy was also put into historical perspective. The transition to more environmentally benign energy sources is yet another phase of economic development that has migrated from wood to coal, to oil, to natural gas, to nuclear, and now to renewables. As economies develop and citizens see their wealth grow, concerns about basic subsistence needs such as food, shelter, and clothing tend to diminish. At this point, environmental gains begin to take greater weight in the consumer decision matrix—not because consumers did not care before, but because other needs took priority. So the emerging environmental policy focus of the developed countries of the world does not necessarily translate to developing countries, because the priorities can be quite different.

The current grand energy challenge is to meet projected global demand with all available resources in an environmentally sustainable way while promoting economic growth and welfare improvement. To do so, it is important to recognize that one size does not fit all, and different approaches may be needed depending on the situation of each country or region. This includes different treatments for the developed world, for the quickly developing economies of China and India, and for places that experience significant energy poverty, such as sub-Saharan Africa. To date, efforts to alleviate energy poverty have largely focused on providing minimal electricity to improve living conditions and afford some human capital development and opportunities for growth. But growth requires

infrastructure and scalable energy services associated with industrialization and urbanization, which in turn results in increased demand for commercial forms of energy.

The importance of understanding what drives energy demand, how the future might unfold, and what policies could be most effective was then emphasized. Baker Institute projections of global primary energy demand by country, by sector, and by fuel were then discussed. It was highlighted that the majority of economic growth over the next couple of decades will come from China, India, and other Asia-Pacific countries. Notably, this represents about 3.0 billion people among the global population of 7.4 billion. By contrast, the developed countries of the world—members of the OECD—account for about 1.3 billion people, with the remaining 3.1 billion people generally distributed across Central Asia, Africa, the Middle East, and Latin America, regions that are at different levels of economic development and are projected to grow at different rates. The sheer scale of the populations in emerging and developing economies around the world is staggering, and it signals that the future of global energy markets may no longer rest with the policies or economic fortunes of the OECD. In fact, with stagnant or declining populations, meager economic growth prospects in the near term, and ardent energy efficiency policies, energy demand growth in OECD countries is not projected to increase in any significant way.

Despite this, the fact that the developed world is no longer driving global energy demand is often missed in discussions on the future of energy. Coal, for example, is not a Western issue any more. Coal consumption in the West will continue to decline, as many coal plants are reaching their life expectancy and—when coupled with various environmentally motivated policies—are likely to be retired. By contrast, a massive proportion of China’s coal delivery and use infrastructure such as rails, mines, and power plants was built over the last decade, suggesting that coal will remain a primary energy source in that country for years to come. Any premature forced retirement of coal infrastructure will carry a burden of enormous stranded costs due to premature capital obsolescence, which would challenge goals of continued high levels of economic growth. However, given the concerted international push to “decarbonize,” it is likely that margins of demand growth will be captured by other fuels such as natural gas and renewables, but any transition away from coal will be rather slow.

The discussion turned to the global crude oil market between 2008 and 2016, and different reasons for the observed production decline among different producers were highlighted. Countries like Norway and the UK experienced a natural decline coupled with aging fields and infrastructure, difficult operating environments, and high costs. By contrast, sector mismanagement was at fault in Mexico and Venezuela, while in countries such as Iran, Algeria, and Libya, sanctions and civil strife were largely to blame. In sum, the amount of production that was taken offline due to aboveground factors—sector mismanagement, civil strife, and sanctions—over the last eight years was roughly equal to the amount of increased US production associated with shale. Given the dramatic growth in demand witnessed in developing Asia and other regions outside the OECD (where demand declined slightly), US crude oil production served an important role. Indeed, the US shale revolution was pivotal in balancing the market over that period, and technology was at the epicenter

of one of the most prolific increases in production ever seen. Moreover, it demonstrates that technology can provide significant leadership opportunities when addressing the grand energy challenge. Qatar was described as well positioned to provide such leadership in technological innovation, particularly given its geographic location and its relatively abundant financial and natural gas resources.

Regarding the role of renewable power, it was recognized that though the growth rate for environmentally benign renewables such as wind, solar, and geothermal has been phenomenal—around 16% annually for the 2000-2015 period—a focus on growth rates might be misleading. To illustrate, the presenter pointed out the small market share of renewables both globally and in the US. What matters for environmental goals is the absolute increase in renewable energy, not percentage increases. For example, an increase of 1 unit on a base of 1 unit represents 100% growth, yet an increase of 1 unit on a base of 100 units represents 1% growth. This relationship also holds globally, as a 3.4% growth in coal use from 2000-2015 added more than ten times as much energy as a 16% growth in renewables. Thus, it is very important to recognize scale when discussing shifts in the energy landscape.

Renewables, natural gas, and energy efficiency are likely to dominate the future path of the US energy system. This will be driven by a well-developed electricity grid where natural gas generation can serve as a backup for non-dispatchable wind and solar resources, and smart technologies can be easily integrated. Consistent with this trend, it is expected that renewables will enjoy strong growth prospects in countries with well-established electricity grids. Despite this, economic considerations will continue to encourage natural gas power plant construction and use, as they can run more reliably and at higher utilization rates than renewables. Coal demand is projected to grow through 2040—albeit at a slower pace than the previous 25 years—largely driven by demand from the developing world. In general, it was noted that the developing world is not equipped to bear the financial burden of climate change mitigation; thus, most efforts must come from the developed world.

Along these lines, it was also emphasized that the developed world could propel efforts to improve energy efficiency across the value chain. For end-users, energy efficiency is a virtual source of supply because it facilitates the attainment of greater energy service, but it does not raise demand for energy commodities. As such, efficiency should be part of any robust effort aimed at mitigating demand growth.

In wrapping up the presentation, it was stressed that the developing world will drive the future of global energy demand growth, and the objectives of its citizens may not fit with the developed world's view. This highlights the need for flexibility and more holistic approaches to energy and sustainability. The importance of scale and innovation cannot be overstated. The energy sector is very capital intensive, and turning its course is akin to turning a VLCC; it happens slowly. Occasionally, however, innovations can trigger relatively rapid shifts, particularly when the incumbent infrastructure is aging. This has been witnessed only in the last 15 years in the US as innovations altered the commercial oil and gas landscape, thereby triggering the shale revolution and the concomitant move away from coal in the electricity

generation mix. Thus, to address environmental concerns in a robust and economically sustainable way, it is important that all types of innovations be considered.

During the Q&A period, many of the audience questions centered on the change of administration following the recent US elections. In response, it was noted that the Baker Institute regularly prepares a comprehensive set of policy recommendations for the incoming administration after each presidential election. One of the current recommendations suggests, for example, establishing a leadership role by addressing global energy issues through engagement in innovation. It was also stressed here that much of what happens in the US is driven by state-level initiative, citing the importance of state-level renewable portfolios and their ability to incentivize the expansion of various renewable technologies, independent of the federal government.

Prompted by a request to delve into the issue of job opportunities associated with the US energy industry, the speaker stressed that the majority of energy-related jobs created over the past eight years was in oil and gas rather than renewables, citing previously published Baker Institute research on the subject. In any case, the driver of all observed employment increases has been innovations that have prompted new opportunities across the board in the energy sector. The potential massive regulatory rollbacks associated with the new administration may help with additional job creation in the oil and gas industry. It was noted that for the developing world, technology-related job creation can be obstructed by aboveground issues, particularly when intellectual property protections are not sufficient to ensure the deployment of new technologies. This is unfortunate, since technology plays a critical role in capturing opportunities and in propelling economic diversification.

The role of policy in the successful deployment of new technologies was also noted. While economic principles matter, establishing a platform suitable for technology deployment can be particularly crucial. In some cases, this can lead to perverse effects that are largely unintended, so the policy vehicles that are ultimately put in place must be well conceived. For example, Germany's decision to phase out nuclear power following the Fukushima crisis drove renewable expansion in the German market. But per the law of unintended consequence, it also led to more investment in coal power to substitute for the lost nuclear baseload.

Responding to a question on the role of smart technologies and storage for making wind and solar dispatchable resources, it was noted that the lack of well-developed grids in the developing world implies the lack of capacity to absorb the variability inherent in certain non-dispatchable resources and implies additional costs for investors. Also, smart technologies generally function better in the presence of a well-developed grid that can deliver electricity at scale. It was generally agreed that smart technologies have a tremendous potential to alleviate the required energy input for a given amount of energy services, but that clear regulatory pathways are needed to maximize efficient deployment.

As to questions on the current position of the GCC on climate policy, it was noted that the region could be a driver for expanding renewable technologies and facilitating broader

climate change mitigation strategies. The role of policy as a coordinating mechanism was also stressed, although the ultimate drivers of any final investment decisions are local and take into consideration labor costs, fixed costs, and access to land and infrastructure. Market competitiveness was also pointed out as a feature that fosters rather than impedes investment by promoting efficient deployment of capital, which can be very important when implementing new technologically focused strategies.

Prompted by a question related to “carbon leakage,” it was stressed that the imposition of a carbon tax on carbon-intensive industries in certain countries may cause those industries to relocate to areas with less stringent regulations. Moreover, mitigating this incentive through a border carbon adjustment tax can lead to a series of very complicated trade negotiations, given the complex nature of carbon-content contributions by specific countries along the production value chain of finished goods.

Several questions from the audience also reflected on the rise of populist movements around the world and what it might mean for the energy sector. Caution was urged against underestimating nationalism the way the previous US administration did. At the same time, it was noted that it is very important to understand the drivers of populist sentiment, rather than be dismissive of them. For example, it was indicated that policymakers should take the effort, on the one hand, to better understand the significance of globalization for consumer welfare while, on the other hand, seeking greater insights into how overall economic growth could be impaired by trade barriers that result in increases in the cost of goods. Such a balance in the discussion can ultimately lead to more balanced policies that serve a broader base.

### **III. Closing Panel Discussion**

The closing session drew on a common thread throughout the workshop sessions: specifically, energy is vital for economic growth and the improvement of welfare and standards of living. The global energy challenge faced today presents every region with different dilemmas and will therefore require different, regionally focused solutions to address them. Every region views the global energy challenge differently, largely because we all view the world from where we sit; the view from North America is often quite different from the view from the Middle East, which is different from the view from Northeast Asia, etc. Moreover, views on the global energy challenge are often different across smaller subsets of North America, the Middle East, Asia, and elsewhere. Such diversity can be daunting, but the dilemmas facing one region are ultimately linked to the dilemmas in others, because any policy action in the GCC, Asia, Europe, North America, or Africa will have ripple effects across the global energy and economic landscape. Accordingly, the importance of recognizing common goals, understanding what is realistic versus what is desired, and allowing for flexibility in the approach is paramount in meeting the global energy challenge. The closing panel seized on this theme to pull together the discourse from the previous panels.

## Summary: Roundtable on Energy and Economic Diversification Policies

Former Minister of Energy and Deputy Prime Minister H.E. Abdullah Bin Hamad Al Attiyah opened the discussion with remarks highlighting the challenges Qatar faces today, such as the need to provide employment for the growing segment of the young population amid low oil prices. He also noted Qatari efforts to diversify away from such heavy dependence on oil and gas toward a knowledge-based economy that emphasizes human capital development. In this context, the importance of the conference was underlined, particularly its focus on diversification. It was noted that the challenge of diversification has often been central to economics and policy discussions since the oil price shocks rocked the world in the 1970s, and that this issue needs to be addressed by the current generation. The former minister pointed to the development, growth and deployment of the SWF as one way to diversify economic interests, effectively leveraging oil and gas wealth to finance an economically resilient future. However, he also mentioned the challenges associated with building and managing a strong SWF, in particular maintaining a long-term sustainable course even under the strongest of political pressures. Concluding his remarks, H.E. Al Attiyah called for involvement of regional policymakers in discussions focused on finding solutions to the issues the GCC countries may face as they move toward a post-hydrocarbon era.

The next speaker, Sheikh Faisal Bin Fahad Al-Thani, Deputy Managing Director of Maersk Oil, was concise in his remarks. He focused on sentiments expressed in the fourth panel of the conference, specifically stressing the importance of technology, innovation, and productivity. To highlight this theme, he pointed to Maersk Oil's successful use of technology and innovation to maximize productivity in developing the Al-Shaheen Oil Field, currently responsible for 50% of Qatar's crude production.

CES Director Dr. Kenneth B. Medlock III noted the success of this conference in stimulating conversations on important issues of energy subsidy reforms, economic diversification, the energy-food-water nexus and its relation to climate change, and the broader global energy landscape. He highlighted how interrelated all these issues are, despite the fact that policy often takes a siloed approach to each. This is ultimately where policies can be set up for failure, because the interwoven nature of each of these challenges necessitates a more holistic approach. Dr. Medlock underscored regionally integrated approaches for tackling problems that reach beyond country borders and emphasized the importance of economies of scale in the areas of innovation and diversification. He then stated that broad, constructive engagement will ultimately lead to better policies to address the energy, environmental, and economic challenges that lie ahead. Despite this, Dr. Medlock continued, national visions across the GCC seem to be developed in separate silos, with different national visions being independently put forth by each country, despite the significant potential for broad regional cooperation across the Gulf in matters ranging from infrastructure to markets. As a wealthy country and as the largest LNG exporter in the world, Qatar is uniquely positioned to establish itself as a leader, particularly in the area of innovation. Dr. Medlock expressed hope that the discussions of the previous two days would be elevated further by research and data analysis so that effective and informed policy can be directed accordingly.

## Summary: Roundtable on Energy and Economic Diversification Policies

The Q&A period that followed each speaker's opening remarks revolved around three interrelated topics that resonated across the two-day event:

1. challenges to the current energy-based economy and the feasibility of establishing a knowledge-based economy,
2. the prospects for active venture capital engagement, and
3. the role of the private sector in the region.

During the Q&A session, the panelists pointed out that there is not a clear definition of “knowledge-based economy” put forth for the GCC region. Rather, it is an oft-used phrase meant to imply overall growth in human capital development and education, and ultimately, the deployment of innovation and technology. The core principle for the GCC region is that innovation and technology be organic and capable of being disseminated in ways that provide leadership, higher productivity, and competitive advantage for the region across sectors and job functions ranging from engineering to petrochemicals, to renewables, to data science. As a result, it was noted that conversations about what a knowledge-based economy means for the GCC are very important, because they can identify areas of comparative advantage and potential excellence. This can, in turn, highlight prospective opportunities for nations as they seek to diversify their asset portfolios in favor of exporting human capital and knowledge rather than natural gas and crude oil.

One question specifically addressed whether Qatar would be able to establish a knowledge-based economy by 2030. In response, another audience participant suggested the possibility of using corporate tax policy to incentivize private companies to fund research and education through local institutions of higher learning, rather than relying on an uncertain revenue stream through donations. In response to the questions and commentary from the floor, Dr. Medlock argued that in order for aspirations for a knowledge-based economy to become reality, a deeper investigation of the regulatory institutions that govern market development is needed. He noted the role of policy in protecting intellectual property rights, which has been pivotal in establishing opportunities in other parts of the world where—for example—venture capital has been an effective tool for developing private enterprise and technology.

Several audience participants subsequently pointed out the lack of local institutional framework that would allow an influx of venture capital. The audience also pointed out barriers to venture capital development, which include the general inexperience of regional entrepreneurs and a general reliance on the local expatriate community. Responding to an inquiry about potential ways to encourage participation in the venture capital space, several audience participants suggested it may be possible to conceive of regulatory protections for infant industries in order to promote risk-taking by local entrepreneurs.

Expanding on the theme of human capital development, an audience participant raised a question about growing the roles of youth and women. This was recognized as an important point by each of the panelists. Dr. Medlock noted the continued efforts of the Baker Institute's Center for Energy Studies to promote female Ph.D. graduates in the energy field, many of whom are now enjoying successful careers in the private sector in

## Summary: Roundtable on Energy and Economic Diversification Policies

different countries around the world. He stressed that the intellectual capacity of individuals needs to be separated from gender and that diversity in background, discipline, and approach is critical for finding efficient and creative solutions to any problem. An audience participant added that Qatar attracts a high number of females in education and various industries. Highlighting the effectiveness with which Qatar has approached diversity in education, he pointed to the example of student enrollment being 45% female at Texas A&M University at Qatar.

To conclude, the panelists were asked to share their views on the vision for 2030; they expressed general optimism. The responses offered included the importance of not being afraid to fail and learning from short-term failures to ensure long-term success, and that shorter planning horizons—perhaps five-year time frames—would be more appropriate to facilitate success in achieving longer-term aspirations going forward. Such flexibility would allow policymakers and planners to react in real time to an ever-changing global market environment.

**ROUNDTABLE  
ON  
ENERGY AND ECONOMIC DIVERSIFICATION POLICIES**

*February 15 – 16, 2017  
Four Seasons Hotel, Al Mirqab Ballroom*

**AGENDA**

**Day 1**

- 09:00 - 10:00**                      **Registration**
- 10:00 – 10:45**                      **Opening panel:**
- Qatar Leadership Centre:**      Dr. Abdulla bin Ali Al-Thani, Managing Director and Member,  
Board of Directors
- Baker Institute:**                      Ambassador Edward P. Djerejian, Director, Baker Institute for Public Policy
- Qatar University:**                      Dr. Hassan Al Derham, President, Qatar University
- Keynote Address:**                      **The GCC and the Role of Energy in Economic Development:**  
H E. Dr. Mohammed Al Sada, Minister of Energy & Industry
- 10:45 – 11:00**                      **Coffee Break**
- 11:00 – 01:00 pm**                      **Panel 1: Energy Subsidy Reform**
- Facilitator:**                      Sheikh Mishal Al Thani, Director, Energy Affairs, Ministry of Energy & Industry
- Presenters:**                      Dr. Jim Krane, Wallace S. Wilson Fellow for Energy Studies, Rice University's Baker  
Institute  
Dr. Francisco Monaldi, Fellow in Latin American Energy Policy, Rice University's  
Baker Institute
- Discussion of various subsidy reform efforts
- i.      How important is subsidy reform?
  - ii.     To what extent have various plans been carried out across fuels and sectors?
  - iii.    What challenges are being presented and how are they being addressed?
- 01:00 – 02:00 pm**                      **Lunch & Prayer Break**
- 02:00 – 04:00 pm**                      **Panel 2: Economic Diversification in Energy Exporting Nations**
- Facilitator:**                      Dr. Ali Ammari, Counselor for Economy and Finance, Prime Minister's Office
- Presenters:**                      Dr. Jim Krane, Wallace S. Wilson Fellow for Energy Studies, Rice University's Baker  
Institute  
Dr. Francisco Monaldi, Fellow in Latin American Energy Policy, Rice University's  
Baker Institute  
Mr. Joe Barnes, Bonner Means Baker Fellow, Rice University's Baker Institute
- Discussion of regional economic diversification efforts

## AGENDA

### Day 2

**09:00 – 11:00**

#### **Panel 3: The Energy-Food-Water Nexus**

**Facilitator:**

Mr. Ali Al-Rahbi, Chief Operating Officer Upstream, Dolphin Energy

**Presenters:**

Mr. Gabriel Collins, J.D., Baker Botts Fellow in Energy & Environmental Regulatory Affairs, Rice University's Baker Institute

Discussion of various regional plans to address the nexus

- i. The stresses in the nexus are a function of perspective.
- ii. Degrees of success of various attempts to address stress in the nexus.
- iii. Is self-sufficiency the optimal, or even desired, goal?

**11:00 – 11:15**

#### **Coffee Break**

**11:15 – 1:15 pm**

#### **Panel 4: Climate Change**

**Facilitator:**

Dr. Ali Hamed Al-Mulla, Assistant Secretary General, Gulf Organization for Industrial Consulting (GOIC)

**Presenter:**

Dr. Kenneth Medlock III, James A. Baker III, and Susan G. Baker Fellow in Energy and Resource Economics, Rice University's Baker Institute

What is the climate challenge and how will civilization cope?

Discussion of the outlook for demand for fossil fuels

- i. How long is the "transition runway"?
- ii. Where does the GCC fit in a world that is increasingly conscious about CO<sub>2</sub> emissions?

**01:15 – 2:30 pm**

#### **Lunch & Prayer Break**

**02:30 – 4:00 pm**

#### **Closing Panel**

**Facilitator:**

Dr. Khalid Al Jaber, Assistant Professor, Political Communication, Gulf Studies Program, Qatar University

**Speakers:**

- H. E. Abdullah Bin Hamad Al Attiyah, former Deputy Prime Minister and Minister of Energy
- Dr. Kenneth Medlock III, Senior Director, Center for Energy Studies, Rice University's Baker Institute
- Sheikh Faisal Bin Fahad Al-Thani, Deputy Managing Director, Maersk Oil