



ENERGY DIALOGUES SUMMARY

Final report prepared by

Kenneth B. Medlock III, Ph.D.

James A. Baker, III, and Susan G. Baker Fellow in Energy and Resource Economics
and Senior Director, Center for Energy Studies

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Kenneth B. Medlock III
"Houston Energy Dialogues: Executive Summary"

This executive summary was prepared from multiple sets of meeting notes by scholars from the Center for Energy Studies at Rice University's Baker Institute, who participated in the event.

Introduction

On April 16, 2019, Energy Dialogues and the Center for Energy Studies (CES) at Rice University's Baker Institute for Public Policy hosted the Houston Energy Dialogues (HED) for the third consecutive year. The event was co-sponsored by Boston Consulting Group and Schlumberger. The series provides an innovative platform for open, inclusive conversations about the energy industry involving representatives from industry, academia, environmental groups, and regulatory bodies. The 2019 HED focused on three themes that shaped the conversations throughout the day: (1) energy innovation, (2) energy transitions, and (3) energy poverty.

- (1) The discussions centered on “energy innovation” addressed new and innovative energy technologies, as well as approaches to improving capital and operational efficiencies, and the potential for transformation across the energy value chain. Notably, “innovation” was expounded in dimensions beyond new energy technologies, providing an important prelude for the other two topics of conversation for the day.
- (2) Conversations about the “energy transition” built on the discussion of energy innovation, exploring the challenges, transition strategies, and concerns that will increasingly demand the attention of companies and key stakeholders as the energy sector evolves. Panelists and experts from the oil and gas industry addressed concerns such as the social license to operate, trust building and transparency, regulatory uncertainties facing companies in the fossil fuels extractive industries and their roles in environmental stewardship and sustainability more generally. The “transition” discussions also encompassed technology pathways in the electricity sector and evolving technologies for reducing carbon emissions across the supply chain.
- (3) The discussions focused on “energy poverty” delved into the resources required to power economies and to ensure broader access to modern energy services. Participants explored the potential solutions for reducing energy poverty, which weaved through topics such as the viability of natural gas as a foundation fuel in different places around the world and the environmental tradeoffs that addressing energy poverty may render.

During the day, participants divided into four different working groups and discussed the issues surrounding each theme. The day also featured two panel discussions dispersed between the working group discussions to provide context. The first panel addressed North American energy production with a focus on the opportunities and challenges faced in the Permian Basin. The panelists included Amir Gerges (Vice President-Permian, Shell), Marie-Helene Ben Samoun (Partner and Managing Director, Leader in Digital Oil and Gas, Boston Consulting Group), and Tracee Bentley (Executive Director, The Permian Strategic Partnership). Ken Medlock (Senior Director, CES) moderated the panel discussion.

The second panel examined new energy consumers and various social and environmental challenges facing the oil and gas industry. The panelists were Susan Waller (Vice President, Stakeholder Engagement & Enterprise Public Awareness Program, Enbridge), Ben Ratner (Senior Director, Lead of the EDF+Business Energy Transition Team, Environmental Defense Fund), and Robert Gaudette (President, Business Solutions, NRG Energy). Rachel Meidl (Fellow in Energy and Environment, CES) moderated the panel discussion.

The day concluded with a summary of the discussions at each working group, which provided an opportunity for each group to hear how the conversations at other tables progressed, and share thoughts across the groups. Ken Medlock delivered closing remarks, offering reflections on the day's discourse.

Theme I: Energy Innovation

The HED began with a discussion on the role of innovation in energy. Participants pointed to the positive impacts technology—such as satellite and drone technology, automation and electrification, among other things—has had on the energy sector. For example, satellites and drone technology have improved the ability to monitor infrastructure and provide additional transparency on operational and environmental issues. In addition, automation at well sites continues to enhance operational efficiency, augment safety, and improve environmental integrity. Electrification of operations also enhances performance in multiple dimensions.

A central topic in the discussions centered on the “energy innovation” theme was the integration of renewables and fossil fuels. For example, participants discussed the National Renewable Energy Laboratory's research on incorporating renewable generation technologies into oil and gas operations along the value chain. Technologies such as electric-drilled rigs, remote operation, and renewable-powered micro grids around operations in the field have the positive benefit of reducing emissions as well as the consumption of oil and gas products during production and distribution. Energy-saving benefits are also associated with increasingly affordable solar panels when used for generation on drill sites. Given that the fracking stage consumes the largest amount of electricity in the entire well lifecycle, and that rigs move every 30 days on average, the use of batteries alongside renewables rather than connecting to a grid or using diesel generators can sometimes be a better option for on-site electricity in places such as the Permian Basin.

Other innovations that were discussed included electric vehicles, battery storage, integration of renewables and fossil fuels on the wholesale power grid, and local production of bioenergy through waste stream management. All of these were raised as options to reduce the carbon intensity of various end-use sectors. Extending that line of thinking, participants also identified opportunities for innovation in applying carbon capture technologies in industrial applications, either for utilization in enhanced recovery of oil and gas or injection into subsurface storage.

Many of the participants also noted that, as important as technological advancement is, its benefits cannot be fully realized if regulations do not reflect a shifting technological reality and utilities do not adopt new business models to better reflect transformation in the power generation sector. Unfortunately, technological advancement can outpace regulatory change and adjustments by large incumbent utilities, which can add uncertainty about how energy innovations can be widely commercialized and how the power grid of the future will be managed. All in all, regulatory consistency is needed. More generally, the participants recognized that both government and energy industry support for all innovation pathways is a necessity if a swift transition away from fossil fuels in power generation is to occur.

In this context, it was noted that Houston has the potential to transform from the energy capital to the energy innovation capital, taking advantage of its role as an energy trading hub. In doing so, it must extend efforts to attract technology companies and foster a business culture conducive to energy startups. It was noted that Houston's recent partnerships with Microsoft and TPH's engagement with Google have been successful steps forward. It was also highlighted that Rice University is home to the Rice Alliance for Technology and Entrepreneurship, which is the #1 Graduate Entrepreneurship Program in the US, and is at the center of plans to develop an innovation district near downtown. The city has also been able to attract Sunnova, the country's second-largest residential solar company, despite the renewable energy industry's apparent preference for the Northeast or the West Coast.

Technology has helped address social challenges that come with growth. It was commented that in some instances, necessity is the mother of invention. In particular, the rapid, largely unexpected growth of production in the Permian Basin created issues such as lack of affordable housing and health care, poorly maintained roads, and over-crowded schools. In fact, the Permian region has had the most dangerous roads in the US, averaging one fatality per day basin-wide and 26,000 crashes in 2017. Addressing this issue required a concerted effort by industry to improve pipeline takeaway capability for oil and gas production and expand produced water handling and logistics in order to minimize trucking needs. Participants discussed a pilot project by Shell and GE that aims to remove 25% of drivers off the roads in Permian by using drones for surveillance and sampling as well as to better manage intervention at well sites.

Finally, it was also noted that technology can help to overcome emerging workforce challenges. Automation and digitalization of operations can create a safer work environment and allow well-trained experts to perform more efficiently. For example, automated drilling operations in the Permian Basin, handled remotely from offices in Houston, have enabled better integration of artificial intelligence technology in the oil and gas production process. Such innovations ultimately enhance production efficiency and improve environmental performance of well site operations.

Theme II: Energy Transition

As noted by one participant, the era of energy transition is also the era of energy abundance, enabled by arguably the most transformative development in global energy markets over the last two decades—the US shale revolution. The resultant tremendous growth of natural gas production in the US has had significant implications for the power generation mix in the US. In turn, this has driven discussions about the role of natural gas in the energy transition. The relatively low carbon intensity of natural gas relative to other fossil fuels, coupled with its flexibility in combustion, means that natural gas has become a fuel of choice for replacing coal in power generation and supporting grid stability as more non-dispatchable renewable generation comes online. In addition, the current abundance of natural gas in the US makes the fuel very attractive for meeting international energy demands in the form of LNG.

Participant discussions also recognized that despite the economic attractiveness of natural gas to meeting energy demand, there are a host of challenges that must be addressed in the era of increased environmental and climate change awareness. Flaring of associated natural gas in oil-directed production was noted as a significant concern. There was a lot of attention given to the significant volume of natural gas being flared in the Permian Basin, much of it due to insufficient takeaway capacity. Exacerbated by the 2014 oil crash, infrastructure development has not kept pace with the rapid production growth in the Permian. It was raised that the industry generally encourages regulatory actions aimed at accelerating infrastructure expansion—permitting, right-of-way, etc.—but when coupled with the large capital expenditures, the risk of regulatory battles poses significant challenges for pipeline projects. However, as pointed out by the HED participants, operators in the Permian Basin could be a significant driver for infrastructure growth and flaring reduction, in particular because they must actively engage the issues to maintain the social license to operate. Of course, as noted by participants, a key driver to capture and monetize flared gas is the market itself. Opportunity for LNG export is expected to grow after 2023, which will provide significant opportunity for low-cost natural gas supplies in the Permian Basin.

With the discussion moving to the issues surrounding electricity, participants considered more decentralized systems, such as micro grids and direct combustion, that could be added to existing centralized systems. However, the transition strategy will need to differ by location, geography, and the available energy resources. For instance, Norway continues to expand the grid with hydro power that covers over 90% of the country's national electricity demand, and provides a role in balancing the expansion of intermittent wind power in Denmark and the Netherlands. But the geography and topography of northwest Europe and Scandinavia provide a unique, robust opportunity for integrated hydro and wind power. Such opportunities do exist universally.

The participants recognized that renewable energy has moved from serving niche market opportunities to widely competing with other forms of energy in many developed countries. One participant commented that polling of US consumers indicates an increasing desire for clean, sustainable, and affordable energy as well as a tendency to favor actions to address concerns about climate change. At the same time, as some participants noted, consumers are demanding more control over their electricity sources, a service that power providers have increasingly made possible.

In addition to consumer trends, a stronger environmental preference and the exercise of market power by large consumers with economy of scale, such as Walmart, play a role in stimulating lower carbon energy supply. As renewables development continues, both natural gas and new energy technologies will play a major role in generation mix. In Texas, changing consumer preference highlights the need for a “smart” grid that can take advantage of the abundant natural gas, the existing electricity network, and market system, and the massive renewable buildout across the state.

Participants noted that the oil and gas industry, for its part in environmental stewardship, can address environmental issues collaboratively with governments, environmental groups, and local constituents in three potential areas: (1) setting a target, (2) developing technology solutions, and (3) proactively engaging in policy discourse. Participants observed that corporations were increasingly setting corporate sustainability targets, usually in line with the United Nations Sustainable Development Goals (SDGs). One example raised is Shell’s methane emissions intensity target of below 0.2% by 2025. Setting and disclosing ambitious, quantitative, and time-bound targets can be a powerful signal of a company’s commitment to environmental stewardship. Additionally, technological solutions to addressing environmental challenges can be accelerated through collaborations between academia, NGOs, and industry. At the same time, it was argued, the oil and gas industry would be best served by supporting reasonable and cost-effective regulations that create regulatory certainty and encourage the adoption of best-in-class practices across the entire industry. Several participants noted that many operators in the oil and gas industry recognize this need, which is why there have been repeated calls for tightening methane regulations despite the Trump administration’s efforts to the contrary. Additionally, it was argued that regulations at the national level are critical so companies do not migrate to states with less stringent environmental regulations, encouraging a race to the bottom.

Several participants highlighted that the oil and gas industry has experienced increasing pressure from the investor community to take steps to reduce the carbon footprint across their operations. It was raised that investor pressure could be the most effective stimulus for firms to give greater weight to sustainability in their future investment decisions.

Other participants noted that regardless of how the future energy system looks, affordability and reliability will remain the most important elements to consumers. So costs will be a primary driver of company strategies. It is, therefore, important that the industry pursue climate efforts via a set of ambitious but sensible and market-oriented policies, all while remaining sensitive to the economically vulnerable.

Many participants recognized that public perception is one of the greatest challenges facing the oil and gas industry. Building trust through transparency is critical to meeting this challenge, especially with stakeholders outside the industry. Today, the public is no longer willing to accept placatory statements and vague, conciliatory messaging around environmental protection. Instead, the industry needs to actively provide transparency and demonstration with real-time data attesting that companies are meeting environmental targets. To that end, the Environmental Defense Fund is collaborating with the industry on a methane monitoring program using satellites that is expected to provide global coverage and considerable visibility by 2021.

There was general agreement among the participants that creating a more balanced and effective narrative for the oil and gas industry presents challenges as well as opportunities. The prevalence of social media allows sensationalism to exert influence over public acceptance, so it is crucial to find platforms to better educate consumers about the role that natural gas can play in enabling greater penetration of renewables so that energy reliability and environmental protection go hand-in-hand in the energy transition. It was also raised that industry should engage more directly with communities in their efforts to shed a positive light on its activities. In terms of coalition building, the oil and gas industry should start with finding areas of common interest among different stakeholders. It is important to elevate the conversation and develop the rational solutions together.

Theme III: Energy Poverty

Almost all of the participants noted that natural gas is currently a superior short-term solution for meeting global energy demand while supporting the growth in renewable energy and reducing carbon intensity. Among the attributes mentioned were (1) natural gas provides a low-cost foundation for transition away from coal (especially in the US), and (2) cost reductions in liquefaction technology have greatly increased the global reach of lower cost supplies in the form of LNG. If adequate natural gas delivery and distribution networks can be developed in low-income regions, LNG can also become an effective solution to addressing energy poverty, bringing low carbon energy to regions in need of sustainable and reliable sources of supply. In other regions, such as Brazil, LNG can balance local hydropower generation that can have high seasonal variability, a function that is already expanding.

That being said, many countries in the developing world lack the necessary LNG infrastructure. In that regard, some participants highlighted the role that floating storage regasification units (FSRUs) could play in providing a solution. When compared to full-scale, land-based facilities, FSRUs are less costly, can be put in place relatively quickly, and are more flexible. They can also be a permanent solution, or they can allow countries to begin using natural gas as they build comprehensive, land-based infrastructure and an efficient delivery system to reach markets reliably.

Participants all recognized that the global energy challenge is complex. The factors in play range from available resources to geopolitics, economics, social stability, and government policy. Therefore, as noted during the closing session, it is critical to avoid a US-centric view when addressing energy access, and global energy issues more generally. The developed world may be transitioning toward a lower carbon future, but some developing regions may prioritize economic and social objectives over the environment. This does not imply that environmental considerations are not high on the list of concerns; rather, it implies that there is an income-dependent preference ordering that takes into account a large number of welfare considerations. In emerging economies like China and India, coal use will not likely disappear in short order due to its low cost and local availability (each of which conveys an energy security benefit) as well as the current legacy of energy infrastructure in each country, especially when compared to imported natural gas. An important socioeconomic consideration is also in play: the coal industry in these countries provides significant job opportunities. Thus, it is crucial that multiple and varied ways for addressing energy needs in the developing world are considered. For example, India could introduce nuclear technology for baseload supply and structure the market in a way that would internalize the environmental cost of burning coal.

When addressing energy poverty, it was noted that meaningful and transformational access to energy can vary from one region to another. Rural areas in the developing world may require different levels of energy supply to make a substantive difference in the human condition, particularly those regions with very low to zero access to electricity. In the end, a portfolio approach that includes a mix of different sources of energy while ensuring affordability was agreed to be a superior approach.

Key Takeaways

A number of important elements arose from the day's deliberations. To begin, open and honest conversations that include perspectives from different parts of value chain and different communities are informative and productive. In particular, it was noted that the expanding diversity of views presented in the HED has significantly enriched the conversations from year to year. Moreover, collaboration across industry, NGOs, government, and academia is of paramount importance to encourage holistic and well-rounded solutions to the issues associated with energy transition, innovation, and transformation.

The energy transition is not the exclusive domain of fossil fuels; it applies to energy as a whole. Understanding this simple point is critical to understanding that there is no single strategy that can address every energy challenge everywhere. Solutions vary based on social, economic, political, and environmental factors. As such, economics remains the most effective force to drive shifts in the market landscape. Without doubt, policy plays an important role in defining the rules of the market and setting regulatory guidance, but absent commercial returns, investment will fall short of meeting stated goals.

Finally, every participant recognized that it is essential to engage with younger generations on energy issues in order to bridge a potential generational divide. Along these lines, it was argued that the oil and gas industry's narrative needs to change. It must reflect shifting market realities and social priorities before solutions can be presented and accepted. Hence, it is incumbent on today's energy leaders to be responsive by providing more windows into the sector, how it operates, and how it has been at the heart of global economic development for over 100 years. Only then can the industry provide a platform for future generations to tackle challenges related to both economic and environmental sustainability.