Pace of Change:
Building a New Energy Future
“CERAWeek is our world stage.”

– Darren Woods, Chair & CEO, ExxonMobil
Patrick Pouyanné, Chair of the Board & CEO, TOTAL S.A.

Eldar Sætre, CEO, Statoil

Bob Dudley, Group Chief Executive, BP plc

John Watson, Chair & CEO, Chevron

Ben van Beurden, CEO, Royal Dutch Shell plc

Darren Woods, Chair & CEO, ExxonMobil

Ryan Lance, Chairman & CEO, ConocoPhillips

Patrick Pouyanné, Chair of the Board & CEO, TOTAL S.A.

Eldar Sætre, CEO, Statoil
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CERAWEek 2017 Video Gallery
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The 36th CERAWeek by IHS Markit focused on “Pace of Change: Building a New Energy Future.” Over 3,500 delegates from more than 60 countries participated in this year’s gathering. Sessions addressed the opportunities ahead—from oil and gas production to power generation, renewable energy, technology, investment, and regulatory and environmental policies.

Some 480 speakers—senior executives and officials, thought leaders, NGOs, and IHS Markit experts from across the energy spectrum and from the policy, financial, technology, and industrial communities—spoke on the nature and pace of change; and identified forces that will be critical to shaping the future business environment and assuring the world’s growing energy requirements.

This year inaugurated the Innovation Agora @ CERAWeek—exploring transformative energy innovations ranging from digital technology to e-mobility, robotics, and connected homes.

We were especially pleased to welcome Canadian Prime Minister Justin Trudeau and to present him with the CERAWeek Global Energy and Environment Leadership Award.

We are deeply thankful to our speakers, partners, and participants for their engagement and contributions to CERAWeek.
“All the international players and the domestic ones come here to talk about the big issues.”

– CNBC
Global oil dialogue

Darren Woods spoke of innovation and technology as a driver for economic growth and environmental progress. He also addressed free trade and infrastructure, including ExxonMobil’s “Growing the Gulf” project.

Leadership dialogue

Sultan Ahmed Al Jaber offered a roadmap and vision for ADNOC’s reorganization, focusing on commerciality, profitability, and efficiency in response to long-term lower oil prices and market dynamics.

Building tomorrow’s infrastructure

Al Monaco and Daniel Sullivan urged updating US regulations to modernize infrastructure and discussed the challenge of building and maintaining relationships among all stakeholders.
Ministerial address

Alexander Novak, Russia’s energy minister, discussed the future of Russian hydrocarbons, the resilient Russian economy, and the historic 2016 agreement between 24 OPEC and non-OPEC countries.

Leadership dialogue

Pedro Parente and Eldar Saetre assessed people-oriented leadership and the importance of a company’s cultural reforms to improve efficiency, productivity, and reputation.

They also discussed deepwater development, enabling economic growth, and knowledge sharing through international cooperation and partnerships.

Investing in the energy future

Roger Diwan, Robert Lawler, Keisuke Kuroki, Marcel van Poecke, and Osmar Abib explored the market’s response to low oil prices, from improving balance sheets and portfolios to capital and operational efficiencies. They focused on the dynamics of the US shale and its future.
Adapting to the new energy era

Ashok Belani, John Hess, and Miguel Gutiérrez discussed how technology, efficiencies, and big data are helping to improve the economics of both shale and offshore projects. They expressed concern that not enough investment was going toward oil and gas exploration to meet future demand.

The new equation for energy and the environment

Carlos Pascual and panelists Patricia Espinosa, Rachel Notley, and Maroš Šefčovič spoke about the future of global energy sustainability in the wake of the Paris Agreement. The EU and Alberta are demonstrating that it is possible to decouple economic growth from emissions. Finally, they discussed how climate change initiatives are an economic and job growth opportunity.
Insight dinners provided a relaxed, informal opportunity for discussion among industry peers and experts. Each dinner centered on a key theme and featured thought-provoking remarks by distinguished commentators, followed by moderated discussions and Q&A with dinner participants.

Insight dinner topics included:

- India’s new hydrocarbon exploration and licensing policy
- New eras for sustainability?
- Oil Price Information Service (OPIS): Future of supply and transportation
- Resilience and cybersecurity: Should we be worried?
- Technological innovation in energy sector—Evolution or revolution?
- The global economic outlook: Pro-growth populism or protectionist populism?
- The race for knowledge: Risks, opportunities, and competitive advantage
- US energy policy post election
- Women leaders in energy

**The race for knowledge** panelists Nabilah Al-Tunisi, Chief Engineer, Saudi Aramco; and David Meza, Chief Knowledge Architect, NASA

**US energy policy** panelists Carlos Pascual, Senior Vice President, IHS Markit; Barry Smitherman, Adjunct Professor of Energy Law, University of Texas Law School; Jason Bordoff, Professor of Professional Practice and Founding Director, Center on Global Energy Policy, Columbia University; Frank Verrastro, Senior Vice President, Center for Strategic & National Studies; and Tom Kuhn, President, Edison Electric Institute

**The global economic outlook** panelists Jerre Stead, Chair & CEO (not pictured), IHS Markit; Nariman Behravesh, Chief Economist, IHS Markit; Dambisa Moyo, Global Economist & Author; Michael Klein, Managing Partner, M. Klein and Company; and Christof Rühl, Global Head of Research, Abu Dhabi Investment Authority
Welcome and ministerial address

Khalid A. Al-Falih related Saudi Aramco’s planned 2018 IPO and Saudi Arabia’s broader Vision 2030 program. He reviewed the recent OPEC and non-OPEC agreement to stabilize the market. Mr. Al-Falih expressed concern for the current underinvestment in long-term development projects and the risks to the future supply/demand balance.

Opening oil plenary

Bob Dudley discussed the lower cost of production brought about by the drop in oil prices. These savings will not be sustained indefinitely. He described BP’s ongoing investment in new projects and shifts in the company’s portfolio. Mr. Dudley shared BP’s interest in instituting a global carbon tax.
Global oil dialogue

Ryan Lance discussed the management of an oil company through the cycle, including how to adapt strategy to a lower price environment. Mr. Lance looked at how to balance short- and long-cycle projects in a portfolio and the potential of tight oil in the United States and the oil sands in Canada.

Ministerial dialogue

Dharmendra Pradhan examined India’s rapidly growing role as a consumer in world energy markets, what India is doing to reduce dependence on energy imports, and plans to develop its domestic refinery segment. Minister Pradhan discussed his vision for India’s power sector, which includes increasing the share of gas.

“CERAWeek…is highlighted on the calendar of every industry leader”

– HE Khalid A. Al-Falih, Minister of Energy, Industry and Mineral Resources, Kingdom of Saudi Arabia
Industry in transition
Mohammed Sanusi Barkindo and Fatih Birol discussed the current state of the oil market. Their conversation focused on the OPEC/non-OPEC agreement and a potential extension, as well the global supply response to higher prices and whether that would lead to a new price volatility. The speakers also shared their views on their respective energy outlooks, the future of demand, and the changing energy mix.

Oil and gas leadership dialogue
Vicki Hollub spoke of Occidental’s repositioning around the world to focus on core areas of production. The potential of the Permian as a whole was a focus of the conversation, as well as the company’s capabilities in enhanced oil recovery. She also addressed Occidental’s leading approach to human resource management through the cycle.
Oil and gas leadership dialogue

José Antonio González Anaya spoke about the reforms PEMEX has undertaken over the past year. PEMEX has shown a commitment to competition and to engaging the private sector. PEMEX has seen the benefits of new joint ventures with new technology, streamlined processes, and an influx of capital and productivity.

Promise and peril: The future of manufacturing, technology, and infrastructure

Joe Kaeser and Thomas Fanning discussed the physical and technological resilience of the electric grid and measures that are being taken to protect key infrastructure from cyber-attacks. The conversation also covered the changing face of global trade.
“This is the Super Bowl of the energy industry.”
– CNBC

Ministerial dialogues

Suhail Mohamed Al Mazrouei described his vision to 2050 for diversifying the United Arab Emirates’ energy sources. He discussed the plan’s economic impact, the critical role of public/private partnerships to stimulate investment, the ability to advance both economic and job growth in the private sector, well-being and happiness, and environmental sustainability.

Jabbar Ali Al-Luiebi discussed the quality and depth of Iraq’s oil and gas resources and export potential as well as the country’s efforts to work more effectively with IOCs to open the gas and oil downstream and upstream markets to private partnerships and investments.

Berat Albayrak spoke about Turkey’s rising demand for energy and the future of the country’s energy mix. He also discussed Turkey’s strategic position in terms of geographic, social, and political influence.
Prolific Permian

Father and son Scott and Bryan Sheffield, both of whom have helmed highly successful independent oil companies active in the Permian Basin, discussed lessons learned and shared over three generations.

Transforming Global E&P

Musabbeh Al Kaabi, Isabel dos Santos, and Vadim Yakovlev discussed the transformations undertaken by E&P companies in the last two years to reinvent themselves. These include use of advanced technologies, operational efficiencies to decrease costs, and high grading investments to improve capital productivity. Panelists described the new models of partnerships between governments and NOCs.
Getting back to growth in the upstream

Bernard Looney, Mario Mehren, and Steve Pastor explored strategies for upstream companies to become financially resilient, regardless of oil price fluctuations. Companies need to focus on portfolios that favor value over volume. Successful companies are encouraging cultures of continuous improvement and challenging status quo to improve efficiency and safety in design and operations.

“Hundreds of oil-and-gas executives and world leaders ... gather for IHS [Markit] CERAWEek, the annual conference in the world’s energy capital, which routinely draws influential players.”

– Wall Street Journal
Dinner keynote

Daniel Yergin and Peter Thiel discussed the nature of innovation as laid out in Mr. Thiel's book Zero to One. Additionally, they examined entrepreneurship and innovation, drawing on Mr. Thiel's experiences as a founder and early investor in some of the world's most successful tech startups, including Facebook and PayPal.

Oil markets and downstream

B. Ashok, Gregory Goff, and Mike Loya assessed changes in oil markets, investment, and costs.
Oil & Gas Strategic Dialogues

Strategic Dialogues provided insights and presentations on key strategic topics, followed by interactive discussions among session participants. Topics included:

- Africa upstream: Renewal ahead—or not?
- Canada’s changing energy policy landscape
- Disclosing carbon asset risk: The shape of things to come?
- Financing the upstream: Recapitalization of upstream sector
- Future of oil and gas development in Asia
- Global refining: Pressures and opportunities
- IOC strategies: Positioning for the future
- Latin America upstream: An exploration hot spot
- NOC strategies: Positioning for the future
- North American refining: Evolving industry and regulations
- Oil price cycles: What are they and where are we now?
- Rethinking sanctions in the new era
- Russia’s energy future: Ministerial dialogue
- Service company strategies: Positioning for the future
- The business of deep water in a new price era
- The new geopolitics of oil: OPEC and non-OPEC
- The Permian phoenix: Rising again
- Upstream performance trends: Enhancing operational efficiency

Latin America upstream panelists Bob Fryklund, Chief Upstream Strategist, IHS Markit (Chair); Gustavo Hernández, Director of Resources, Reserves and Associations, PEMEX Exploration and Production; Déci Oddone, Director-General, Brazilian ANP; Michel Hourcard, President & CEO, TOTAL E&P Americas, LLC; and Orlando Velandia, President, ANH

Africa upstream panelists Daniel Berkove, Senior Associate, Energy, IHS Markit (Chair); Tonye Cole, Executive Director & Co-Founder, Sahara Group Limited; Andrew Kamau, Principal Secretary, State Department of Petroleum, Ministry of Energy & Petroleum, Republic of Kenya; and Geoffrey White, CEO, Africa Agility

Russia’s energy future panelists Matthew Sagers, Managing Director, Russian & Caspian Energy, IHS Markit (Chair); Nikolay Buynov, Co-Founder, President, & Chair of Board of Directors, Irkutsk Oil Co.; Vadim Yakovlev, Deputy Chair of the Management Board, First Deputy CEO Upstream, Gazprom Neft; Sergey Kudryashov, General Director, Zarubezhneft; HE Alexander Novak, Minister of Energy, Ministry of Energy of the Russian Federation; Dmitry Konov, Chair of the Management Board, Sibur; Mikhail Margelov, Vice President, Transneft; Denis Khramov, Deputy Chair of the Management Board, Novatek; and Roman Panov, CEO & Director General, JSC ROSGEO
Whatever happened to globalization?

David Farr, Jesse Norman, and Ulrich Speisshoffer discussed trade in a post-Brexit, post-PTT world. The group spoke about automation, the changing nature of work, and the factory floor of the future.

Global gas

Datuk Wan Zulkiflee Wan Ariffin, Charif Souki, Simon Blakey, and Michael Stoppard shared their thoughts on the global state of the gas and LNG business. They also discussed the significance of upstream industry players investing in the entire value chain, particularly the downstream.
Energy dialogue

Patrick Pouyanné discussed the current oil market and geopolitical prospects, as well as TOTAL’s strategy for the energy transition, including how the company is making acquisitions in clean energy and the role of gas in the transition.

“CERAWeek...is the kind of forum which...sets trends in the energy industry.”

– HE Alexander Novak, Minister of Energy, Russian Federation
North America’s E&P future

Harold Hamm, Jeff Ventura, and R.A. Walker explored the role of US oil and gas production and the overall potential of global production. The speakers each gave an overview of the plays in which they are active in the United States, and their perspectives on the impact of the new administration and on the balance between oil and gas.

The global LNG future

Anatol Feygin, Yuji Kakimi, and B.C. Tripathi spoke of opportunities and challenges to grow future LNG demand, including prioritizing gas infrastructure planning and purchasing; educating consumers and policymakers; marketing gas to compete against coal, especially in emerging markets; creating an Asian spot market to improve price stability; and granting flexible, shorter-term contracts that still adequately finance supply growth.
Leadership dialogue

John Watson discussed the new regulatory environment for the industry under the Trump Administration, and the importance of rapid permitting processes for infrastructure. He described Chevron’s strategy in a lower oil price environment, lessons from the completion of large LNG projects, the future of oil demand, and the potential risk of a future supply gap given lower investment in the upstream today.

Ministerial dialogue

James Gordon Carr spoke of the three principles—economic growth and job creation, engagement of stakeholders, and environmental protection—embedded in Canada’s ongoing review of its energy regulatory process. Mr. Carr’s vision for the Canadian energy sector in 2020 is one that is greener and cleaner, with sustainable extraction of fossil fuels and transportation through safe pipelines.

“A conference that brings together many of the most powerful people in the global energy sector”

– Canadian Broadcasting Corporation (CBC)
Ministerial dialogue

Hirohide Hirai discussed Japan and METI’s focus on gas as a means of energy security for Japan. Japan is making strategic regulatory changes to facilitate trade and create a more liquid Asian gas market.

Natural gas and its markets

With the shale boom, gas became plentiful and inexpensive. At the same time, gas, as a fossil fuel, has been under attack. Robert Ineson, James Fitterling, Colette Honorable, and Edward Monser discussed the market potential for natural gas, and what must be done to realize it. Close attention was paid to the role of large capital projects in realizing that potential, the role of regulation in guiding projects, and the potential costs of regulation.
Energy and the future of mobility

James Burkhard, Lawrence Burns, Tiffany Groode, and Greg Scheu discussed the future of automotive mobility, including changes in consumer behavior with shared or pooled vehicles, technology implications for energy, infrastructure needs, and IHS Markit’s new Reinventing the Wheel study.
Natural Gas & Global Energy Strategic Dialogues

- Ministerial dialogue: Prospects for the Levant Basin
- After the Permian: What’s next for North America?
- Asian gas markets: Reforms, new players, and implications for LNG
- Does pricing carbon have a future?
- Economic reform in the Middle East: Opportunities and challenges
- Follow the money: How do coal producers meet demand?
- India: The emerging energy powerhouse?
- Is a global liquids supply gap looming?
- LNG cost and innovation
- New gas supplies
- North American gas: Going oily and arriving late
- North American gas demand: Go abroad or go home?
- Prospects for LNG hubs
- Solving Southern Cone’s natural gas trade puzzle
- Supplying gas to Europe: Capitalizing on a growing, flexible market
- The future of exploration
- The promise and challenge of growing LNG demand in a period of oversupply
- The role of gas in the low-carbon transition
- Upstream and infrastructure finance

LNG cost and innovation panelists Audie Setters, CEO, LoneStar LNG; Grant Wattman, President & CEO, Agility Project Logistics; Dick Brown, President & CEO, Ferus; Rod Christie, President & CEO, Turbomachinery Solutions, GE Oil & Gas; and Rafael McDonald, Director, Global Gas and Global LNG, IHS Markit (Chair)

The promise and challenge of growing LNG demand panelists Laurent Vivier, Senior Vice President, Gas, TOTAL S.A.; and RK Garg, Director, Finance, Petronet LNG Limited

Economic reform in the Middle East panelists Mahmoud El-Gamal, Professor & Chair in Islamic Economics, Finance, and Management, Rice University; Suzanne Maloney, Deputy Director, Foreign Policy Program; Senior Fellow, Brookings Center for Middle East Policy, Energy Security & Climate Initiative, The Brookings Institution; David Scott, President, IDG; Samer Al-Ashgar, President, KAPSARC; and Carlos Pascual, Senior Vice President, IHS Markit (Chair)

How do coal producers meet demand? panelists Jim Thompson, Senior Director, Coal, IHS Markit (Chair); Ted O’Brien, Senior Director of Capital Markets & Marketing, Xcoal Energy & Resources; Christopher Moravec, President, Blackhawk Mining, LLC; Michael Dudas, Partner, Vertical Research Partners; and Jim Griffin, Advisor, Griffin Mining Advisors
Opening dialogue

Ben van Beurden spoke about the new landscape for the energy industry, including lessons from mega-projects and their future, the unconventional revolution, and Shell’s decision to leave the Artic. Discussion also focused on the energy transition, including the role of gas, the future of oil demand, and Shell’s wind business.

Shaping the electricity future

Lawrence Makovich, Lynn Good, Pedro Pizarro, and Isabelle Kocher characterized the changes in the electricity business and strategies to create value. The panel discussed repositioning along the value chain to emphasize lower carbon energy resources and more coordinated networks. The wide-ranging discussion explored emerging technologies, grid modernization and digitalization, central versus distributed generation resources, and cyber threats.
Environmental policy
dialogue

Scott Pruitt spoke about his
perspectives as the new Administrator of
the US Environmental Protection Agency.
His priority areas include reducing
federal authority over state-based
regulation, reducing the gap between
legislation and regulatory rule-making,
and less use of court settlements to
promulgate regulation.

Electric power
transition:
Global strategies

Jean-Bernard Lévy and
Peter Terium discussed the
dramatic changes in global
power generation. The
conversation also covered
the push by power generators
for decentralization,
decarbonization, and
digitalization.

Scott Pruitt, Administrator, US Environmental Protection Agency

Peter Terium, CEO, innogy SE

Jean-Bernard Lévy, Chair & CEO, Électricité
de France (EDF)
Powering a new energy future

Ignacio S. Galán, Jaime Francisco Hernández Martínez, and Jean-Pascal Tricoire cited business cases from Iberdrola, CFE, and Schneider Electric for strategies that advance sustainability and economic growth: Companies can be greener, more efficient, and profitable.

Global nuclear power: What lies ahead?

Jone-Lin Wang chaired a plenary with John Hopkins, Maria Korsnick, Daniel Poneman, and Jay Wileman on the future role of nuclear in achieving the Paris Accord goal of a 2°C reduction in carbon emissions by 2050. They discussed new reactor designs, safety, reliability, and costs, as well as how the United States needs to rebuild its supply chain after a 30-year hiatus in building new reactors. A key challenge is how to compensate the benefits of nuclear power in competitive power markets.
Dinner dialogue

Prime Minister Justin Trudeau spoke about Canada’s role in an increasingly polarized global system. He offered a vision for a future that includes both environmental stewardship and responsible natural resource development.

Fuel choices and technologies for tomorrow’s power business

John Browne and Judy Marks had a wide-ranging discussion on how new technologies, business models, and government policies will transform the global energy and power industry. Encouraging risk taking and innovative approaches to addressing climate change will make the energy sector exciting again for the next generation of engineers and scientists.
Energy & Power Strategic Dialogues

- Coal’s evolving role in Asia’s power future
- Competitive generation: Learning curve or winner’s curse
- Developing markets: Powering economic development
- Distributed resources: Generation, demand-side flexibility, and storage
- Electric market structure: Balancing multiple objectives
- European power markets: The market design and climate imperative
- Future of the global renewables market
- Texas power: The pace of change
- The 2016 price boom: Does this change the outlook for global coal?
- The future of solar
- The new panorama of Latin America power

Global renewables market panelist Laura Folese, CEO, BP Wind Energy, BP
Coal’s evolving role in Asia panelist Young Ju Kim, General Manager, Clean Power Generation Lab, KEPCO
Latin America power panelist Doris Capurro, President & CEO, LUFT Energia
Developing markets panelist Hon. James Musoni, Minister of Infrastructure, Rwanda
Distributed resources panelist Sergej Mahnovski, Director, Strategic Planning, Edison International

Texas power panelists Michael Pickens, Associate Director, Energy, IHS Markit; Barry Smitherman, Adjunct Professor, University of Texas Law School; Manu Asthana, President, Direct Energy Home; Paula Gold-Williams, President & CEO, CPS Energy; and Toby Baker, Commissioner, Texas Commission on Environmental Quality
Reflections on CERAWeek 2017: Where do we go from here?

IHS Markit experts **Atul Arya, Antonia Bullard, Roger Diwan, Paul Markwell, Shankari Srinivasan, and Jone-Lin Wang** summarized the key themes emerging from CERAWeek 2017. For oil: cautious optimism for price recovery and upstream companies “getting back to growth” with focus on optimizing their portfolio and using technology as a means to manage costs. For natural gas: expect growth in demand; competition among LNG suppliers; and intra-fuel competition among gas, coal, and renewables. For electric power: climate change policies and the impact of Paris will drive the future of the power sector, including an accelerating pace of growth of renewables and technology.
Carlos Pascual, Senior Vice President, IHS Markit (Chair); Nicholas Eberstadt, Henry Wendt Chair in Political Economy, American Enterprise Institute; Meghan O’Sullivan, Kirkpatrick Professor of the Practice of International Affairs; Director of the Geopolitics of Energy Project, Harvard University Kennedy School; Angela Stent, Director of the Center for Eurasian, Russian and East European Studies; Professor of Government and Foreign Service, Georgetown School of Foreign Service; and Evan Feigenbaum, Vice Chair, Paulson Institute

What’s ahead in Washington?

Lisa Murkowski and John Cornyn discussed NAFTA and the impact changes would have on their respective border states. They explored a range of central national and global issues on the US political agenda.

The US and the world: The new geopolitics

Nicholas Eberstadt, Evan Feigenbaum, Meghan O’Sullivan, and Angela Stent considered the new geopolitics of energy. In a world of complex, diverse interests and goals, vision and direction will be critical. Global leadership is becoming more decentralized with critical leadership increasingly coming from the energy and technology sectors.

Senator Lisa Murkowski, Chair, US Senate Energy and Natural Resources Committee, Alaska; and Senator John Cornyn, Majority Whip, US Senate, Texas
Climate & energy strategies post-Paris

Mohamed Jameel Al Ramahi, Rachel Kyte, Laurence Tubiana, and Maria Zuber examined energy strategies post-Paris Accord. The panelists shared business cases and successes behind the initiatives to decarbonize economies. Decarbonization can be done in economically viable and sustainable ways as countries, cities, and companies learn, develop, and improve tools to meet climate strategies.

Envisioning the new energy economy

Gary Demasi and Jonah Goldman explored future pathways for the energy transition. The experience of the late 1990s and early 2000s with investments in the energy sector is influencing perception of risks and scale-up challenges. Established and emerging companies need to collaborate and cooperate through this transition, exemplified by initiatives such as “Mission Innovation.”
Where next for industrial America?

Andrew Liveris offered a vision for manufacturing in the United States, the importance of getting the regulatory balance right, and the future of globalization.

Andrew Liveris, Chair & CEO, The Dow Chemical Company

Frontiers of science and innovation: Future technologies to meet the energy and climate challenge

Michael Strano, Troy Van Voorhis, David Keith, and Robert Armstrong provided a glimpse into technologies being pursued at MIT’s Energy Initiative. These range from nanosensors for reaction network analysis to the study of electronic properties of molecules and materials that will enable next-generation, high-efficiency energy technologies as well as consumer behavior and the formation of markets for emerging automotive technologies.
Expert Discussions provided outlooks by IHS Markit experts, followed by interactive discussions.

**Oil & Gas**

- Border adjustment tax: Implications for oil prices and trade
- Changes in marine fuel specs and impact on refining margins
- Global energy scenarios: Reinventing the wheel
- Global liquids supply outlook
- Latin America upstream
- Natural gas liquids: Where will the market absorb supply growth?
- Outlook for E&P terms and other upstream investment conditions in 2017
- RINS: Market impact of biofuels and blending requirements in the United States
- Super basins outside the United States
- The great cost reset: The new competitive dynamic in US unconventionals, global deep water, and the Middle East
- Upstream capital strategies in the wake of the reset

**Outlook for E&P terms:** Mariam Al-Shamma, Senior Manager, Petroleum Sector Risk, and Irena Agalliu, Managing Director of Consulting

**Global energy scenarios:** James Burkhard, Chief Researcher, Global Oil Markets & Energy Scenarios & CERAWeek Vice Chair (standing on left)

**Global liquids supply outlook:** Ha Nguyen, Associate Director, Global Oil

**Changes in marine fuel specs & impact on refining margins:** Sandeep Sayal, Director, Downstream Energy Research and Consulting

**Outlook for E&P terms:** Michael Marinovic, Vice President, Energy Strategy Consulting
Gas & Power Expert Discussions

• Global renewables—Technology, policy, and market
• IHS Markit outlook for fuel prices and interfuel competition
• India and China: A tale of two power markets
• Latin America gas and power markets: What’s next?
• North American power trends and scenarios
• North American shale gas supply

IHS Markit outlook for fuel prices: Samuel Andrus,
Senior Director, Energy and Natural Resources

Latin America gas & power markets:
Emanuel Simon, Associate Director,
Latin America Energy

India & China: Xizhou Zhou, Senior Director,
Energy and Natural Resources

India & China: Jenny Yang, Manager,
China Oil and Gas

IHS Markit outlook for fuel prices:
Gautam Sudhakar, Director, Global LNG

North American shale gas supply
The inaugural Innovation Agora @ CERAWeek focused on emerging technologies. It was a dedicated space with unique and innovative programs connecting ideas and people across industries.

With over 75 speakers and 2,000 attendees, Agora showcased disruptive technologies and demonstrations of cutting-edge applications that will impact the energy future.

Agora STUDIOS
Attendees and thought leaders across different sectors participated in interactive discussions in an intimate theatre-in-the-round setting.

Man + Machine: The changing workforce (from left to right): Dr. Antonio Merlo, Professor, Dean of the School of Social Sciences, Rice University; Susan Kish Agora Curator, CERAWeek, IHS Markit (Chair); Jay Timmons, CEO, National Association of Manufacturers; and David Farr, CEO, Emerson

Next City: Power and mobility in the metropolis (from left to right): Anders Sjoelin, NA Lead, Power Grids Division, ABB Group; Andrew Icken, Chief Development Officer, City of Houston; and Roger Krakenburg, Senior Director, Global Power & Innovation, IHS Markit (Chair). Not pictured: Stephen Zoepf, Executive Director, Center for Automotive Research, Stanford University; and Bryan Cox, Director of Transmission & Distribution Operations, Avista

Today's reality? The digital oilfield (from left to right): Vivek Chidambaram, Managing Director, Global Digital Lead, Accenture, and Ahmed Hashmi, Global Head of Upstream Technology, BP
DISCOVERY SHOWCASES engaged participants with demos and prototypes of some of the latest AI, IoT, robotics, and drone technologies.

ABB | YuMi—world’s first collaborative robot
Emerson | Industrial IoT with augmented reality

CyPhy Works | Drones, tethered unmanned aerial vehicles
ABB | Energy in the extreme—Mars
Honeywell | Virtual reality training techniques

Siemens | Smarter pumping for crude oil pipelines through data analytics
Bentley Systems, a Siemens Strategic Partner | ContextCapture 3D modeling software
Centrica | Hive—Smart homes
EXPLORATION PODS featured presentations throughout the week by technology thought leaders, 2017 CERAWeek Energy Innovation Pioneers, and researchers from foremost academic institutions.

**ABB** | Who’s afraid of the big, bad cloud? | **Guido Jouret**, Chief Digital Officer

**Centrica** | Hive: How to drive innovation from within big business | **Sudeep Maitra**, Global Director, Strategy

**Accenture Strategy** | Uberization of onshore: What if the well was the customer? | **Tom Bonny**, Managing Director

**Rice University** | Using 3D printing to test state-of-the-art drilling simulator test rigs | **Dr. C. Fred Higgs**, John and Ann Doerr Professor of Mechanical Engineering (center)

**Siemens** | A data-driven approach to equipment maintenance of offshore platforms | **Stig Olav Settemsdal**, Global Head, Portfolio Management & Innovation, Offshore Solutions (on right)

**Energy Market Authority of Singapore** | Project OptiWatt | **Eugene Toh**, Director, Policy & Planning
AGORA LINK provided the community with opportunities to work, connect, and explore the space.
The CERAWeek Future Energy Leaders Program engaged exceptional individuals from companies, policy, academic institutions, and NGOs. The focus was on high-potential young professionals and how to meet future energy challenges. Future Energy Leaders attend the main CERAWeek conference, as well as special programs designed to stimulate ideas, collaboration, and solutions.

The Future Energy Leaders consisted of 70 individuals from 34 companies and four academic institutions.

Participants formed a community that extends beyond CERAWeek through friendships, learning, and collaboration.
The Women in Energy community at CERAWeek—some 300 strong—gathered at a private reception hosted by the American Petroleum Institute (API) and a Women Leaders in Energy dinner hosted by Edison Electric Institute (EEI). Antonia Bullard, Vice President, IHS Markit, chaired a dinner discussion at which panelists shared personal experiences and insights.
Eight entrepreneurs, chosen from a cross-section of oil, gas, power, and transportation sectors, were recognized at CERAWeek 2017 as Energy Innovation Pioneers. Selected by a panel of IHS Markit technology experts, these individuals presented new and exciting technologies and businesses models with the potential to disrupt the global energy industry.

**CERAWeek 2017 Energy Innovation Pioneers:**
- **Alion Energy**—Mark Kingsley, President & CEO
- **CyPhy Works**—Helen Greiner, Founder & CTO
- **Fluidic Energy**—Steve Scharnhorst, CEO
- **Hyliion**—Thomas Healy, Founder & CEO
- **Maana**—Babur Ozden, Founder & CEO
- **Magseis**—Idar Horstad, CEO
- **Opus One Solutions**—Joshua Wong, Founder & CEO
- **Rheidiant**—Murat Ocalan, Founder & CEO
The 2017 **Leadership Circle** at CERAWeek is an invitation-only program exclusively for senior executives in the Upstream, Downstream, CFO, Technology and Innovation, Global Gas, Global Power, and North American Independents communities.

The Leadership Circle allowed focused, highly interactive discussions and an opportunity to explore common concerns, develop new relationships, gain insights, and share experiences and perspectives.
**EPICs**

Energy Partner Informal Conversations (EPICs) are private roundtable discussions bringing together ministers with CERAWEek partners.

*Part of the CERAWEek Partnership program.*
Community Gatherings
Community Gatherings (continued)

Lance Uggla, President, IHS Markit; and HE Mohammad Sunusi Barkindo, Secretary General, OPEC
Jerre Stead, Chair & CEO, IHS Markit, and Daniel Yergin, Co-Chair, CERAWeek & Vice Chair, IHS Markit
**Media Coverage & Impact**

- **3,500+** delegates, including senior executives, governmental officials, thought leaders, NGOs, and IHS Markit experts

- **815+** organizations representing over 60 countries

- **480+** speakers on energy, strategy, markets, finance, economics, geopolitics, and technological innovation

*CERAWEek 2017 generated broad news coverage in the US and international media.*

- **18,000** global media mentions across **110** countries

- **15,000** news articles

- **300+** accredited journalists onsite representing top global media

- **23,000** social media mentions

- **265** million Twitter impressions

- **CNBC** dedicated over **140** minutes live

- **100** segments of broadcast news coverage at CERAWeek by **CNBC**, Nightly Business Report, Bloomberg TV, CNN, and others

*Daniel Yergin, Co-Chair, CERAWeek & Vice Chair, IHS Markit*

*Robert Lawler, President, CEO, & Director, Chesapeake Energy Corporation, and Jackie DeAngelis, reporter, CNBC*
Benefiting from the culture of idea exchange and learning that defines CERAWEK, the Partnership program provides highly focused and enhanced engagement in the CERAWEK community.

Partners support the core CERAWEK mission—knowledge sharing, insight generation, and professional community. Partners contribute thought leadership, perspectives, expertise, and enhanced executive participation in public and private CERAWEK programs. Partners benefit by deepened engagement and relationships; as well as heightened experience and visibility at CERAWEK.

*Stephen Zoepf*, **Executive Director, Center for Automotive Research, Stanford University (on left)**

*Whiskey Tasting hosted by ABB***
HE Shri Dharmendra Pradhan, Minister of State for Petroleum & Natural Gas, India, explores augmented reality at the Emerson Agora Discovery Showcase.
Total References Colour

- 30/01/2014

Strategic Partners

Emerson | Additive manufacturing demo in Agora Exploration Pod

Next door: The connected home of the future (from left) Eric Krauss, Global Product Director, Connected Home, Accenture Digital; Mateo Jaramillo, former VP, Tesla Energy; and Roy Vella, VP/GM, Connected Home NA, Centrica
CERAWeek Partners (continued)

Industry Partners

Media Partner

THE WALL STREET JOURNAL.
Agora Studio session on **Agile, autonomous, and additive: Reshaping the global energy supply chain:** (from left) **Ric Fulop,** CEO & Co-Founder, Desktop Metal; **Jon Hirschtick,** CEO & Co-Founder, Onshape; **Paul Bonner,** Vice President, Consulting and Analytics, Connected Home, Honeywell; **John Larson** (Chair, back to camera), Vice President, Big Data & Analytics, Technology, IHS Markit; and **James Bellingham,** Director, Center for Marine Robotics, Woods Hole Oceanographic Institution
OFFICIALS

Rt. Hon. Justin Trudeau
Prime Minister, Canada

HE Sultan Ahmed Al Jaber
Minister, State in the UAE; CEO
Abu Dhabi National Oil Company

HE Suhail Mohamed Al Mazrouei
Minister, Energy, UAE

HE Berat Albayrak
Minister, Energy & Natural Resources, Turkey

HE Khalid A. Al-Falih
Minister, Energy, Industry, & Mineral Resources, Kingdom of Saudi Arabia

HE Jabbar Ali Al-Luiebi
Minister, Oil, Republic of Iraq

HE Mohammad Sanusi Barkindo
Secretary General, OPEC

Fatih Birol
Executive Director, IEA

Hon. James Gordon Carr
Minister, Natural Resources, Canada

Hon. John Cornyn
Majority Whip, US Senate (Texas)

Patricia Espinosa
Executive Secretary, UNFCCC

Hirohide Hirai
Director-General, METI, Japan

Andrew Kamau
Principal Secretary, Petroleum, Ministry of Energy & Petroleum, Kenya

Hon. Lisa Murkowski
Chair, US Senate Energy & Natural Resources Committee (Alaska)

Hon. Rachel Notley
Premier of Alberta, Canada

Hon. Jesse Norman MP
Parliamentary Under Secretary of State, Minister for Energy & Industry, UK

HE Alexander Novak
Minister, Energy, Russian Federation

HE Shri Dharmendra Pradhan
Minister, Petroleum & Natural Gas, India

Scott Pruitt
Administrator, US EPA

HE Dr. Yuval Steinitz
Minister, National Infrastructures, Energy & Water Resources, Israel

Hon. Daniel Sullivan
US Senator (Alaska)

Hon. Chandima Weerakkody
Minister, Petroleum Resources Development, Sri Lanka

EXECUTIVES

Musabbeh Al Kaabi
CEO, Mubadala Petroleum

Mohamed Jameel Al Ramahi
CEO, Masdar

José Antonio González Anaya
CEO, PEMEX

Datuk Wan Zulkiflee Wan Ariffin
President & Group CEO, Petronas Nasional Berhad (PETRONAS)

B. Ashok
Chair, Indian Oil Corporation Ltd.

Ben van Beurden
CEO, Royal Dutch Shell plc

Lord Browne of Madingley
Executive Chair, L1 Energy

Robert Dudley
Group Chief Executive, BP plc

Thomas Fanning
Chair, President, & CEO, Southern Company

David Farr
Chair & CEO, Emerson

Ignacio S. Galán
Chair & CEO, Iberdrola

Gregory Goff
Chair, President, & CEO, Tesoro Corporation

Lynn Good
Chair, President, & CEO, Duke Energy

Miguel Gutiérrez
Chair, YPF S.A.

Harold Hamm
Chair & CEO, Continental Resources

John Hess
CEO, Hess Corporation

Jon Hirshtick
CEO & Co-Founder, Onshape

Vicki Hollub
President & CEO, Occidental Petroleum Corporation

Joe Kaeser
President & CEO, Siemens AG

Yuji Kakimi
President, JERA Co., Inc.

Isabelle Kocher
CEO, Engie

Keisuke Kuroki
President, JOGMEC

Ryan Lance
Chair & CEO, ConocoPhillips

Robert Lawler
President, CEO, & Director, Chesapeake Energy Corporation

Jean-Bernard Lévy
Chair & CEO, EDF

Andrew Liveris
Chair & CEO, The Dow Chemical Company

Jaime Francisco Hernández Martínez
CEO, Comisión Federal de Electricidad

Mario Mehren
Chair of Board of Executive Directors, Wintershall Holding GmbH

Al Monaco
President & CEO, Enbridge

Pedro Parente
President, Petrobras

Pedro Pizarro
President & CEO, Edison International

Patrick Pouyanné
Chair of Board, CEO, & President, TOTAL S.A.

Eldar Sætre
President & CEO, Statoil

Isabel dos Santos
CEO, Sonangol Group

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Executive Chair & CEO, Pioneer Natural Resources

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Chair of the Board, Tellurian

Ulrich Spiesshofer
CEO, ABB Group

Peter Terium
CEO, innogy SE

Peter Thiel
Investor & Entrepreneur, Founders Fund

Jean-Pascal Tricoire
Chair & CEO, Schneider Electric

B.C. Tripathi
Chair & Managing Director, GAIL (India) Limited

Jeff Ventura
Chair, President, & CEO, Range Resources

R.A. Walker
Chair, President, & CEO, Anadarko

John Watson
Chair & CEO, Chevron

Darren Woods
Chair & CEO, ExxonMobil

*Partial List
Past Featured Speakers*

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President George W. Bush
President Bill Clinton
Enrique Peña Nieto
President, Mexico
Henry Kissinger
US Secretary of State
Henry Paulson
US Treasury Secretary
Mohammed Hamed Saif Al-Rumhy
Minister, Oil & Gas, Oman
Gen. Keith Alexander
Director, US NSA Commander, US Cyber Command
Norman Bay
Chair, FERC
Ben Bernanke
Chair, US Federal Reserve
Pedro Joaquin Coldwell
Secretary of Energy, Mexico
Tomás González Estrada
Minister, Mines & Energy, Colombia
Josh Frydenberg
Minister, Resources, Energy & Northern Australia
Ólafur Ragnar Grimsson
President, Iceland
Richard Haass
President, Council on Foreign Relations
HE Dr. Ashti Hawrami
Minister, Natural Resources, Kurdistan
John Hickenlooper
Governor, Colorado
Sally Jewell
US Secretary of the Interior
John Kasich
Governor, Ohio
Tord Lien
Minister, Petroleum & Energy, Norway
Ernest Moniz
US Secretary of Energy
Admiral Mike Mullen
Chair, US Joint Chiefs
Irene Muloni
Minister, Energy, Uganda
Salvador Namburete
Minister, Energy, Mozambique
José Maria Botelho de Vasconcelos
Minister, Petroleum, Angola

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Chair & CEO, General Motors
Nick Akins
Chair, President, & CEO, American Electric Power
Mohamed Al Hammadi
CEO, Emirates Nuclear Energy Corporation
Nizar Al-Adsani
Deputy-Chair & CEO, Kuwait Petroleum Corp.
Vagit Alekperov
President, Lukoil
Greg Armstrong
Chair & CEO, Plains All American
Greg Boyce
Chair & CEO, Peabody Energy Corp.
Peter Coleman
CEO, Woodside Petroleum Ltd.
Iain Conn
CEO, Centrica
Christopher Crane
President & CEO, Exelon
Theodore Craver
Chair & CEO, Edison International
Charles Davidson
Chair & CEO, Noble Energy
Leo Denault
Chair & CEO, Entergy
Claudio Descalzi
CEO, Eni
Anthony Earley
Chair & CEO, PG&E
Thomas Farrell, II
Chair & CEO, Dominion
Greg Garland
Chair & CEO, Phillips 66
Bill Gates
Co-Chair, Gates Foundation
Russ Girling
President & CEO, TransCanada
Andrés Gluski
President & CEO, AES
Andrew Gould
Chair & CEO, Schlumberger
David Hager
Chair & CEO, Marathon Petroleum
Jeffrey Immelt
Chair & CEO, General Electric
Richard Kinder
Co-Founder, Chair, & CEO, Kinder Morgan
Bill Klesse
Chair & CEO, Valero Energy
Fanrong Li
CEO & President, CNOOC
Zhenya Liu
Chair, State Grid Corporation of China
Andrew Mackenzie
CEO, BHP Billiton
Mpho Makwana
Chair, Eskom Holding Ltd.
Thomas May
Chair, President, & CEO, Eversource Energy
Alexander Medvedev
Deputy Chair of the Management Committee, Gazprom
Steve Mueller
Chair & CEO, Southwestern Energy
Doug Oberhelman
Chair & CEO, Caterpillar
Harald Schwager
Board Member, BASF
Igor Sechin
Executive Chair & CEO, Rosneft
Fred Smith
Founder, Chair, President, & CEO, FedEx
JB Straubel
Co-Founder & CTO, Tesla Motors
Jim Teague
CEO, Enterprise Products Partners
Rex Tillerson
Chair & CEO, ExxonMobil
Yilin Wang
Chair, CNPC
Steve Williams
President & CEO, Suncor Energy
Pat Vincent-Collawn
Chair & CEO, PNM Resources

*Partial List
Past Speakers

President Bill Clinton and President George W. Bush with Daniel Yergin

Ernest Moniz
former US Secretary of Energy

Bill Gates
Co-Chair, The Gates Foundation

Admiral Mike Mullen
Chair, Joint Chief of Staffs

Henry Kissinger
Former US Secretary of State

Yilin Wang
Chairman, CNPC

Jeffrey Immelt
Chair & CEO, General Electric

Zhenya Liu
Chairman, State Grid Corporation of China
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Iain Conn
CEO, Centrica

Ben Bernanke
Chair, US Federal Reserve System

JB Straubel
Co-Founder & Chief Technical Officer, Tesla Motors

Igor Sechin
CEO, Chair of the Management Board, & Deputy Chair of the Board of Directors, Rosneft

John Kasich
Governor, Ohio

John Hickenlooper
Governor, Colorado

President HE Paul Kagame
Republic of Rwanda

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Save the Date

**Date:**
March 5–9, 2018

**Place:**
Hilton Americas, Houston, Texas

**Registration, Program, and Speakers:**
www.ceraweek.com
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