



**USEA**

United States Energy Association

**ANNUAL**  
*Report*  
2017





## **THE UNITED STATES ENERGY ASSOCIATION**

THE UNITED STATES ENERGY ASSOCIATION HELPS EXPAND ENERGY INFRASTRUCTURE IN DEVELOPING COUNTRIES WITH THE U.S. AGENCY FOR INTERNATIONAL DEVELOPMENT, AND DRIVES POLICY AND TECHNICAL DISCUSSIONS WITH THE U.S. DEPARTMENT OF ENERGY TO EXPAND THE USE OF CLEAN ENERGY TECHNOLOGY GLOBALLY. USEA IS THE U.S. MEMBER OF THE WORLD ENERGY COUNCIL, THE ACCREDITED ENERGY BODY OF THE UNITED NATIONS. THROUGH ITS MEMBERSHIP, USEA REPRESENTS MORE THAN 100 COMPANIES AND ASSOCIATIONS ACROSS THE U.S. ENERGY SECTOR, FROM THE LARGEST FORTUNE 500 COMPANIES TO SMALL ENERGY CONSULTING FIRMS. USEA'S OBJECTIVE IS TO CONVEY INFORMATION ABOUT THE REALITIES OF GLOBAL ENERGY ISSUES IN THE 21ST CENTURY.

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## A Message FROM OUR CHAIRMAN

Dear USEA Members & Friends,

USEA accomplished a great deal this year, and I am proud to help highlight that in this 2017 Annual Report.

Energy development continues to be central to U.S. and global economic growth. Concurrently, in the industrialized world, we are trying to produce and deliver more energy to meet a growing global demand. Our industry is working to reduce energy poverty, and reduce emissions from industrial operations, power plants, and transportation. We are also trying to preserve and protect our environment and resources.

Against this backdrop, a public affairs debate rages on over what countries are doing to meet global emissions targets and what role various resources, including and especially fossil fuels, can play in this paradigm. This cacophony came to a head during United Nations climate talks in Bonn, Germany during COP23 in November, when USEA Executive Director Barry Worthington joined the White House panel on the role of clean coal. We will need to serve another 3.4 billion people with energy while maintaining service to the existing 3.7 billion consumers as world population is projected to increase by 2 billion people by 2050. In my view, there is a place for all renewable resources. There is also a place for nuclear and other traditional fuels.

USEA represents more than 100 members across the energy sector. Our membership has a unique view and perspective on the various roles for diverse sources of energy and how to advance them. We look forward to continuing our work thanks to the support of our members and partners.

Among international energy stakeholders, USEA specialists have built a brand for our country that represents reliability, economic development and prosperity for U.S. companies and the developing world. USEA has enjoyed a fruitful partnership with the United States Agency for International Development. In fact, this year we celebrate 26 years with USAID, expanding energy infrastructure around the world, bringing together stakeholders and helping to educate and grow the sector globally. It has certainly been an exciting year, and we look forward to our continued cooperation.

USEA also works closely with the U.S. Department of Energy's Office of Fossil Energy on projects like the Carbon Sequestration Leadership Forum, an international effort to advance the use of carbon sequestration technology. Our team at USEA continues to explore opportunities for joint research, technology development, and commercial collaboration.

In 2017, USEA completed its 94th year as the U.S. member committee of the World Energy Council, the U.N.-accredited energy body. USEA's Executive Director, Barry Worthington, has done an outstanding job representing the country, the organization and the U.S. energy sector in that role. He continues to provide sound counsel on energy development, and changing geopolitics that affect the sector writ large. USEA is a stable resource for global energy ministers, stakeholders and industry in the United States.

The Trump administration began ushering in new policies underpinned by an idea that the country could produce and satisfy its own energy demand and help supply the growing global demand for resources. These policies have infused certainty across the sector and unfolded opportunities for our industry. This has launched a robust debate about the role of various fuel sources, discussions about changes to the U.S. electricity market, natural gas abundance and price stability, oil production increases, regulation rollback and positioning the country as the number one producer of oil and natural gas. USEA is at the core of all of these discussions and developments, promoting education about, and access to, all forms of energy worldwide.

In closing, I am honored to serve as the Chairman of the United States Energy Association. On behalf of our staff and members, I want to thank you for your continued support.

We are looking forward to a dynamic and collaborative 2018.

*Vicky A. Bailey*

Chairman  
United States Energy Association



MERRIBEL S. AYRES



*Principal*  
Lighthouse Consulting  
Group, LLC

VICKY A. BAILEY



*Principal*  
BHMM Energy Services, LLC

CHARLES BERARDESCO



*Interim President & CEO*  
North American Electric  
Reliability Corporation

JOHN J. BUCHOVECKY



*Partner*  
Van Ness Feldman, LLP

BRUCE CULPEPPER



*U.S. Country Chair  
& President*  
Shell Oil Company

ROBERT FEE



*Chief of Staff*  
Cheniere Energy, Inc.

JACK E. FUTCHER



*President &  
Chief Operating Officer*  
Bechtel Group, Inc.

JACK GERARD



*President & CEO*  
American Petroleum Institute

DONALD R. HOFFMAN



*President & CEO*  
Excel Services Corporation

SHEILA SLOCUM HOLLIS



*Partner, Member of the  
Executive Committee, and Chair*  
Washington, D.C. Office  
Duane Morris, LLP

MICHAEL W. HOWARD



*President & CEO*  
Electric Power  
Research Institute

BRIAN KEARNS



*Chief Financial Officer*  
U.S. Energy Association

MARIA G. KORSNICK



*President & CEO*  
Nuclear Energy Institute

THOMAS R. KUHN



*President*  
Edison Electric Institute

DAVE MCCURDY



*President & CEO*  
American Gas Association

MAJIDA MOURAD



*Vice President,  
Government Relations*  
Tellurian, Inc.

JOSEPH M. NAYLOR



*Vice President, Policy,  
Government & Public Affairs*  
Chevron Corporation

CHARLES PATTON



*Executive Vice President –  
External Affairs*  
American Electric Power

HAL QUINN



*President & CEO*  
National Mining  
Association

RANDALL B. ROE



*Vice Chairman (Ret.)*  
Burns & Roe Enterprises, Inc.

EDMUND O. SCHWEITZER, III



*President, Chairman  
of the Board &  
Chief Technology Officer*  
Schweitzer Engineering Laboratories

KEN L. SMITH



*Senior Vice President,  
Business Development  
& Strategy*  
Fluor Corporation

RUSSELL STOKES



*President & CEO*  
GE Power & Water

LYDIA THOMAS



*President & CEO (Ret.)*  
Noblis

BARRY K. WORTHINGTON



*Executive Director*  
U.S. Energy Association

DANIEL YERGIN



*Vice Chairman*  
IHS Markit



BOARD  
OF DIRECTORS

# USEA *Members*

# 2017

AECOM

ADVANCED ENGINEERING  
ASSOCIATES INTERNATIONAL

AEGIS INSURANCE  
SERVICES, INC.

AMERICAN COAL COUNCIL

AMERICAN COUNCIL OF  
ENGINEERING COMPANIES

AMERICAN ELECTRIC POWER

AMERICAN FUEL &  
PETROCHEMICAL  
MANUFACTURERS

AMERICAN GAS ASSOCIATION

AMERICAN GEOLOGICAL  
INSTITUTE

AMERICAN PETROLEUM  
INSTITUTE

AMERICAN PUBLIC POWER  
ASSOCIATION

AMERICAN SOCIETY OF  
MECHANICAL ENGINEERS

ASSOCIATION OF ENERGY  
ENGINEERS

ASTM INTERNATIONAL

BAKER BOTTS, LLP

BATTELLE PACIFIC NORTHWEST  
LABORATORY

BECHTEL GROUP, INC.

BHMM ENERGY SERVICES

BLACK & VEATCH

BLUEWAVE RESOURCES

BNL CLEAN ENERGY INC.

BROOKHAVEN NATIONAL  
LABORATORY

BURNS AND ROE  
ENTERPRISES, INC.

CHEMONICS

CHENIERE ENERGY, INC.

CHEVRON CORPORATION

CLIFTON LARSON ALLEN, LLP

COMBINED CYCLE JOURNAL

CONOCO PHILLIPS

CONTOUR GLOBAL

DELOITTE

DHL CUSTOMER SOLUTIONS &  
INNOVATION

DUANE MORRIS LLP

ECODIT

EDISON ELECTRIC INSTITUTE

ELECTRIC POWER RESEARCH  
INSTITUTE

ELECTRIC POWER SUPPLY  
ASSOCIATION

ENBRIDGE

ENERGY & MINERAL LAW  
FOUNDATION

ENERGY EQUIPMENT &  
INFRASTRUCTURE ALLIANCE

ENERGY MARKETS GROUP, INC.

ENERGY POLICY INSTITUTE OF  
AUSTRALIA

ENERGY SYSTEMS &  
TECHNOLOGY

ENGIE NORTH AMERICA

ENGILITY CORP.



ERNST & YOUNG	LIGHTHOUSE ENERGY GROUP	SIEMENS ENERGY, INC.
ESTA INTERNATIONAL	MID-WEST ENERGY RESEARCH CONSORTIUM	SMART ELECTRIC POWER ALLIANCE
EXCEL SERVICES CORP.	MORGAN STANLEY DEAN WITTER	SOLAR ENERGY INDUSTRIES ASSOCIATION
EXELON CORPORATION	MOTT MACDONALD	SOUTHERN COMPANY
EXXONMOBIL CORPORATION	NATIONAL ENERGY FOUNDATION	STRATEGIC POWER SYSTEMS, INC.
FLUOR	NATIONAL MINING ASSOCIATION	SUMMIT POWER GROUP
GAS SYSTEMS ENGINEERING, INC.	NATIONAL OCEAN INDUSTRIES ASSOCIATION	TELLURIAN, INC.
GAS TECHNOLOGY INSTITUTE	NATIONAL RURAL ELECTRIC COOPERATIVE ASSOCIATION	TENNESSEE VALLEY AUTHORITY
GE POWER AND WATER	NATURAL GAS SUPPLY ASSOCIATION	TETRA TECH
GEE STRATEGIES GROUP, LLC	NEXANT, INC.	THE ABRAHAM GROUP, LLC
GEOHERMAL ENERGY ASSOCIATION	NORTH AMERICAN ELECTRIC RELIABILITY CORPORATION	THE GEE STRATEGIES GROUP
GEOHERMAL RESOURCES COUNCIL	NUCLEAR ENERGY INSTITUTE	U.S. - CHINA ENERGY AND ENVIRONMENTAL TECHNOLOGY CENTER / TULANE UNIVERSITY
GLOBAL DEVELOPMENT OPPORTUNITIES, LLC	OAK RIDGE NATIONAL LABORATORY	U.S. AGENCY FOR INTERNATIONAL DEVELOPMENT
GORRELICK, TIEVY & ASSOCIATES	OLIVER WYMAN CONSULTING	U.S. DEPARTMENT OF ENERGY
HUNTON AND WILLIAMS	PEABODY ENERGY	U.S. GEOLOGICAL SURVEY
ICF INTERNATIONAL	PEPCO HOLDINGS	UNIVERSITY OF FLORIDA - PUBLIC UTILITIES RESEARCH CENTER
IDAHO NATIONAL LABORATORY	PETCO INTERNATIONAL LLC	UNIVERSITY OF MINNESOTA DULUTH
IHS MARKIT	PLANNING & FORECASTING CONSULTANTS	UNIVERSITY OF SOUTHERN CALIFORNIA ENERGY INSTITUTE
INTERSTATE NATIONAL GAS ASSOCIATION OF AMERICA	PRICEWATERHOUSECOOPERS, LLP	VAN NESS FELDMAN, P.C.
JOHNSON CONTROLS, INC.	SACRAMENTO MUNICIPAL UTILITY DISTRICT	WEST FINANCIAL SERVICES, INC.
JORDAN CAPITAL MANAGEMENT	SCHWEITZER ENGINEERING LABORATORIES	WESTINGHOUSE ELECTRIC COMPANY
KPMG, LLP	SHELL OIL COMPANY	
LAWRENCE LIVERMORE NATIONAL LABORATORY		
LEHIGH UNIVERSITY		

# INCREASING *the* UNDERSTANDING *of Energy Issues*

## 10<sup>TH</sup> ANNUAL ENERGY SUPPLY FORUM

JULY 27, 2017



*Vincent DeVito, Energy Policy Counselor to Secretary of the Interior, explains the vast opportunities for offshore energy projects and how energy resource exploration contributes to the Interior's five-year plan.*

The 2017 Annual Energy Supply Forum brought together the country's top energy industry and policy leaders to examine the current state of exploration and production, electricity generation, global and domestic fuel supply.

A renewed sense of optimism revealed itself as speakers discussed new opportunities with the shift in U.S. energy policy. The country was coming out of eight years of industry constraints and redundant regulation that thwarted production to a world of streamlined permitting processes, expansion and investment. This would be a pro-business, market-based economy.

Interior Secretary Ryan Zinke's Energy Counselor, Vincent DeVito, said as much to set the stage for the 2017 Forum. He described the Department's priorities--to open up offshore production, and remove hurdles for onshore development to help meet the country's growing energy demand.

Policy leaders reviewed the outlook for all production, from fossil fuels to renewable energy and the global impact.





## 28TH ANNUAL ENERGY EFFICIENCY FORUM

OCTOBER 12, 2017

In 2017, the Canadian Embassy in Washington, D.C., hosted the Energy Efficiency Forum. Organized by the U.S. Energy Association (USEA) and Johnson Controls Inc., the annual event highlighted how energy efficiency isn't just an American priority, but a global one.

The forum included government officials who collaborated on ways to advance economic development and energy efficiency expansion. Event speakers discussed policies, technologies, economic development, and best practices that expand energy innovation and meet global energy goals.



*Dan Brouillette, Deputy Secretary of the U.S. Department of Energy (DOE), says the DOE is in the 21st century and emphasizes the importance of innovation for the National Energy Technology Laboratory.*



*USEA Executive Director Barry Worthington says that only by working together can we maximize our energy efficiency and expand energy access worldwide.*

# USEA ANNUAL MEMBERSHIP MEETING & PUBLIC POLICY FORUM

MAY 4, 2017 at the National Press Club

The tenor of the 2017 Annual Membership Meeting & Public Policy Forum was optimistic, the mood celebratory.

The Forum brought together more than 150 energy stakeholders, journalists, diplomats, and government agency officials to help USEA highlight industry achievements, a new administration, the gains of an energy policy pivoting from constraint to growth and development.

USEA looked forward, but reflected on the 25-year partnership with the U.S. Agency for International Development (USAID).

USEA Executive Director, Barry Worthington, opened the Forum by highlighting the profound, tangible and ubiquitous role partnerships play in the improvement of system operations in developing countries.

He emphasized the countless commercial opportunities partnerships bring to the U.S. energy industry and government entities involved.

His Excellency Erzhan Kazykhanov, Ambassador of Kazakhstan to the United States spoke about the partnership, the future of energy sustainability and economic growth in the U.S. and overseas.

USEA staff presented the 2017 USEA Project of the Year award to Schweitzer Engineering, a longtime USEA partner and a key player in energy expansion.

In 2017, Schweitzer Engineering reduced electric outages in Brcko, Bosnia and Herzegovina by 51 percent under the USAID Brcko Project.

Special guests of the Forum included S.T. Hsieh, Director of the US-China Energy and Environmental Technology Center at Tulane University, who spoke on the US-China Trade Forum.

Hsieh spoke about the progress and changes from 2016 to 2017 and concluded his remarks by officially announcing the second U.S.-China Trade Law Forum that would be held that fall.

Dave McCurdy, President and CEO of the American Gas Association, shared an exclusive preview of the 27th World Gas Conference to be held in 2018.

After McCurdy, Ron Munson, the Global CCS Institute's Global Lead for Capture, presented the CCS policy and technology update and explained the critical role CCUS plays in a portfolio of low carbon technologies.

In 2017, with assistance from government agencies, members, and international partners, USEA was on the frontlines for energy development, innovation, and expansion.

Our teams helped move along the continuum of USAID's Power Africa initiative, which brought electricity to 60 million families on the continent.

USEA helped the Energy Department write an LNG handbook that became Tanzania's blueprint to develop its natural gas and LNG sector.

Overall, 2017 was a historic year for the American energy community, USEA partners and its members.





# ABOUT THE UNITED STATES ENERGY AWARD

THE UNITED STATES ENERGY AWARD WAS ESTABLISHED IN 1989 TO RECOGNIZE PREEMINENT ENERGY LEADERSHIP INITIATIVES AND CONTRIBUTIONS TO INTERNATIONAL UNDERSTANDING OF ENERGY ISSUES. THE AWARD SELECTION COMMITTEE, COMPOSED OF NATIONAL ENERGY LEADERS, EXAMINES EACH NOMINATION FOR AN ARTICULATED SET OF VALUES AND HISTORY OF PROVEN ACCOMPLISHMENTS. SUPPORT FOR USEA IS A MAJOR CONSIDERATION.



The United States Energy Award Selection Committee was pleased to announce Congressman Joe Barton, Vice Chairman, United States Committee on Energy and Commerce, as the recipient of the 2017 United States Energy Award. Congressman Barton received this award in

recognition of his outstanding efforts to advance global energy initiatives and his support of USEA. Congressman Barton was first elected to serve the Sixth District of Texas in 1984. In 2004, he was selected by his colleagues to be the Chairman of the House Committee on Energy & Commerce – the oldest standing legislative House committee. Barton was the first Texan since former House Speaker Sam Rayburn to chair this important committee. The Energy & Commerce Committee has arguably the broadest non tax-oriented jurisdiction of any congressional committee, with principal House responsibility for matters relating to energy, commerce, public health and marketplace interests. Barton is currently the senior Republican and serves as Vice Chairman of the full Energy and Commerce Committee. In the 115th Congress, Barton served as the Dean of the Texas Delegation and is the 9th most senior Member of the House.

## 2017 UNITED STATES ENERGY AWARD RECIPIENT

**CONGRESSMAN JOE BARTON**

*Vice Chairman, House Committee on Energy and Commerce*

“ I am honored to receive this award, and truly humbled to see my name listed among this award’s past recipients,” Barton said. “Throughout my career, I have worked to strengthen the energy sector and provide Americans with affordable and reliable sources of energy. Today we are blessed to lead the world in energy production – a position we will not soon lose. ”

– WAXAHACHIE DAILY DELIGHT

## PREVIOUS AWARD RECIPIENTS

- 2016 **Rex Tillerson** – Chairman & Chief Executive Officer, ExxonMobil Corporation
- 2015 **Senator Lisa Murkowski** – Chairman, United States Senate Committee on Energy & Natural Resources
- 2014 **Llewellyn King** – Creator, Host & Executive Producer - “White House Chronicle”
- 2013 **James E. Rogers** – Chairman, President and CEO - Duke Energy
- 2012 **John W. Rowe** – Chairman Emeritus, Exelon Corporation
- 2011 **Michael G. Morris** – Chairman & CEO, American Electric Power
- 2010 **Peter J. Robertson** – Vice Chairman (Retired), Chevron
- 2009 **Robert B. Catell** – Chairman, National Grid, US
- 2008 **Donald P. Hodel** – Chairman, Summit Power Group, Inc. & Former Secretary, U.S. Department of Energy and Department of the Interior
- 2007 **Spencer Abraham** – Former Secretary, U.S. Department of Energy
- 2006 **Lee R. Raymond** – Retired Chairman & CEO, Exxon Mobil Corporation
- 2005 **Stephen D. Bechtel, Jr.** – Chairman Emeritus, The Bechtel Group, Inc.
- 2004 **John M. Derrick** – Chairman, Pepco Holdings, Inc.
- 2003 **Archie W. Dunham** – Chairman, ConocoPhillips
- 2002 **General Richard L. Lawson** – Former President, National Mining Association
- 2001 **Kenneth Lay** – Chairman & CEO, Enron
- 2000 **P.J. “Jim” Adam** – Chairman Emeritus, Black & Veatch
- 1999 **Don D. Jordan** – Former Chairman & CEO, Reliant Energy
- 1998 **William O. Doub** – Retired Attorney, Morgan, Lewis & Bockius LLP
- 1997 **Daniel Yergin** – President, Cambridge Energy Research Associates
- 1996 **W.J. “Jack” Bowen** – Retired Chairman & CEO, Transco
- 1995 **George V. McGowen** – Chairman, Executive Committee, Baltimore Gas & Electric
- 1994 **John F. Bookout** – Retired President & CEO, Shell Oil Company
- 1993 **Dr. Henry Linden** – Founding President & President Emeritus, Gas Research Institute
- 1992 **John Kiely** – Honorary Chairman, World Energy Council – Retired President, Bechtel Corporation
- 1991 **William McCollam, Jr.** – President Emeritus, Edison Electric Institute
- 1990 **Dr. Chauncy Starr** – Founding President & President Emeritus, Electric Power Research Institute
- 1989 **Walker Cisler** – Former Honorary Chairman, World Energy Council; Former Chairman & CEO, Detroit Edison Co.

# 2017 USEA VOLUNTEER AWARD RECIPIENTS



## USEA CORPORATE VOLUNTEER AWARD

CALIFORNIA INDEPENDENT SYSTEM OPERATOR

*Accepting the award:*

Terri Moreland, Director of Federal Affairs – California ISO

## INDIVIDUAL AWARD

ROBERT STATON

Manager, System Operations

Xcel Energy



## USEA PROJECT OF THE YEAR AWARD

CARLOS QUECAN

Vice President, International  
Schweitzer Engineering Laboratories



### NOT PICTURED:

SAMIR SNAGIC, Executive Manager, Power Utility Division, JP “Komunalno Brčko” d.O.O.



## BRIEFING SERIES

USEA regularly organizes informational briefings on CCS and CES-related issues that are of interest to our members and energy influencers. Some featured speakers include:

**JOHN HARJU** and **BILL SAWYER**, ALLETE Clean Energy, “North Dakota’s Carbon Management Solutions”

**BENJAMIN SPORTON**, CEO World Coal Association, “The New Global Dynamics of Coal”

**MICHAEL KERBY**, ExxonMobil Research; and **FRANK WOLAK** and **TONY LEO** of FuelCell Energy

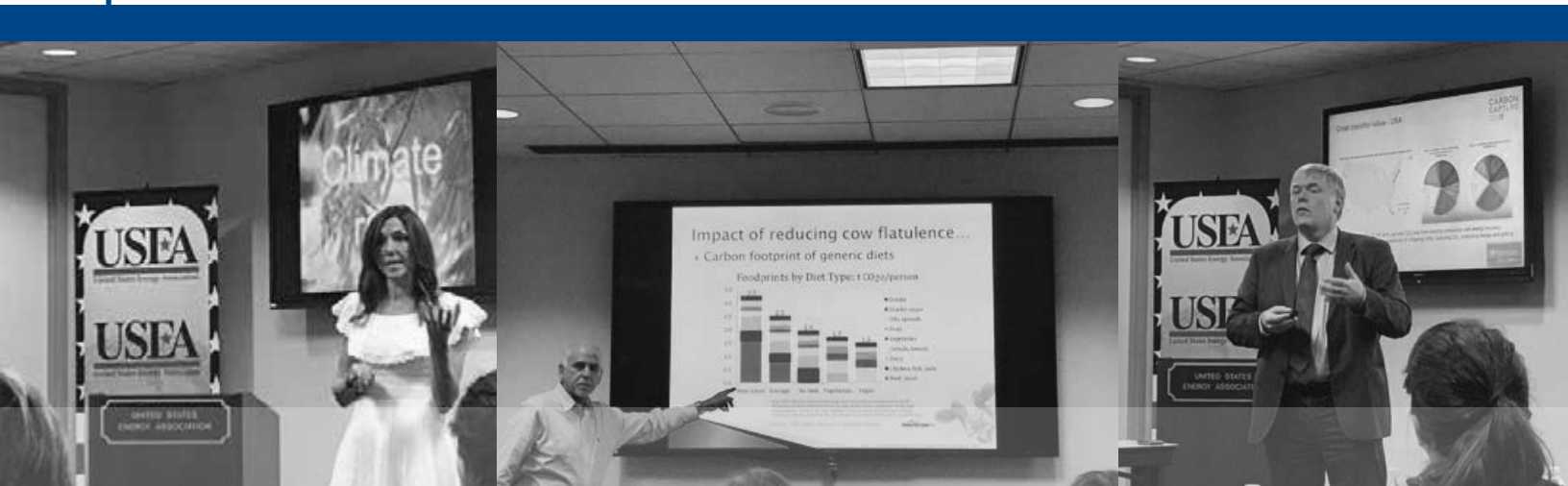
**SALLIE GREENBERG**, the University of Illinois, “Does Carbon Capture and Storage Help Meet CO2 Reduction Goals? Perspective from the Illinois Basin”

**GEORGE SKOPTSOV**, President and CEO, H Quest Vangaurd, Inc., “Coal’s Bright Future: Unlocking New Markets with Novel Technologies”

**ALFRED BROWN**, Founder, CEO, and Chairman, ION Engineering; and **TIM MERKEL**, Vice President of Technology, Membrane Technology and Research, Inc., “The Importance of R&D in Advancing Energy Technologies”

**CARBON UTILIZATION RESEARCH COUNCIL**, “Analysis of Options to Overcome Barriers to Unilateral and Multilateral Large-Pilot Projects for Fossil Fuel Based Power Plants Equipped with CCS” Speakers included:

- **SHANNON ANGIELSKI**, Executive Director, Carbon Utilization Research Council
- **JOHN LITYNSKI**, United States Department of Energy
- **FRANK MORTON**, National Carbon Capture Center
- **CHRIS ROMANS**, Mitsubishi Heavy Industries America
- **DON STEVENSON**, Gas Technology Institute



# BROADENING ENERGY SECTOR *Relationships*

## 17TH U.S. - CHINA OIL AND GAS INDUSTRY FORUM (OGIF) NOVEMBER 14-16, 2017 in Ningbo, China

The U.S. – China Oil & Gas Industry Forum (OGIF) is a public-private partnership involving government and industry representatives from the United States and China. The forum enables the two countries to meet common goals, including the sustainable development of secure, reliable and economic sources of oil and natural gas, while facilitating investment in the energy industry.

In 2017, China's National Energy Administration (NEA) hosted the 17th OGIF in Ningbo, China. NEA Deputy Administrator, Li Fanrong, opened the forum by celebrating the ongoing collaboration between industry and governments to strengthen each country's energy security. Discussions at the event focused on the potential for trade growth between the U.S. and China enabled by the U.S. gas revolution.

Acting Deputy Assistant Secretary for Oil & Natural Gas at the U.S. Department of Energy, Rob Smith, highlighted that U.S. LNG exports to China quadrupled in 2017. He also acknowledged that the U.S. would become a net exporter of natural gas in 2017, with IEA projecting total exports of around 10bcf/d by 2040. According to Pipeline & Gas Journal, China is expected to become the world's largest natural gas user with demand estimates at 21 Tcf per annum by 2040. The 17th OGIF underscored the importance of strong energy ties between the U.S. and China. LNG exports will be critical to the U.S. reducing its trade imbalance with China.

The 18th U.S. – China Oil and Gas Industry Forum will take place in September 2018 in Houston, Texas.



*National Energy Administration Deputy Administrator Li Fanrong celebrates the growing energy relationship between the U.S. and China at the 17th OGIF. U.S. LNG exports to China quadrupled in 2017 as the U.S. became a net natural gas exporter for the first time in 60 years*

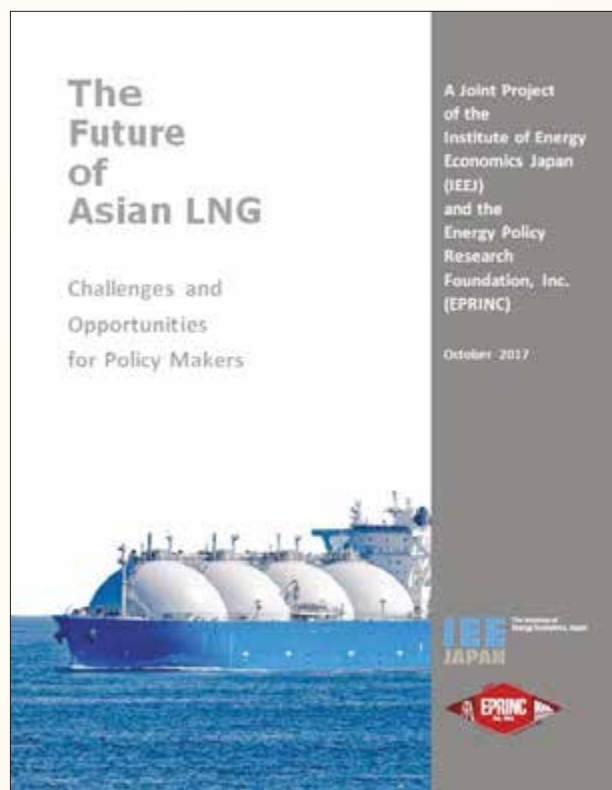


*Acting Deputy Assistant Secretary for Oil and Natural Gas at the U.S. Department of Energy Rob Smith leads one-on-one discussions between the U.S. Government and industry and the Chinese Government and industry on the future of U.S. – China oil and gas cooperation.*



## STUDYING THE FUTURE OF ASIAN LNG: CHALLENGES AND OPPORTUNITIES FOR POLICY MAKERS

OCTOBER 18, 2017 in Tokyo, Japan



With funding from the U.S. Department of Energy's Offices of Fossil Energy and International Affairs, USEA released a report in 2017 discussing the future of Asian LNG markets. The study, conducted in partnership with the Institute of Energy Economics Japan (IEEJ) and the Energy Policy Research Foundation (EPRINC), examines trends in Asian LNG markets and identifies opportunities to streamline U.S. LNG exports to Asia.

The report found that the U.S. natural gas resource base is growing and poised to continue growth without significant increase in prices. At the same time, demand growth in Asia is expected to grow by about 250 percent by 2030. Countries like China and India will be the primary drivers of this growth.

The report also makes several recommendations on how to stimulate demand growth. Key recommendations include the removal of destination restrictions on LNG contracts to stimulate spot markets; streamlining the U.S. regulatory approval process; engaging the Panama Canal Authority to support long-term and cost-effective movement of LNG vessels between the U.S. and Asia; and developing energy mix targets in Asian markets to facilitate LNG imports.



# 13TH ANNUAL STATE OF THE ENERGY INDUSTRY FORUM

JANUARY 31, 2017

USEA begins every calendar year with its signature State of the Energy Industry Forum, which typically occurs around the U.S. President's State of the Union address and allows associations' chief executives to lay out their public policy objectives and explain how their priorities comport with the administration's goals.

In January 2017, just a week after the inauguration of President Donald Trump, the 13th annual forum was especially significant; there was much to discuss.

Energy policy was pivoting from eight years of industry constraining regulations and roadblocks, and subsidies for certain types of generation, to a market-based economy, where industry was predicted to thrive, and American energy development and dominance would be the underlying mantra.

USEA Chairman Vicky Bailey opened the discussions and dove right into a pool of optimism.

"Hearing President Trump's energy policy plan is like lifting the regulatory anvil off the chest of my industry and allowing us to stand up, take a deep breath, and compete," Hal Quinn, USEA Board member and CEO of the National Mining Association, said to generate nods from more than 150 Forum participants.



USEA Board member and Pulitzer-prize winning author Dan Yergin, vice chairman of IHS Markit, moderated the first of three panels where Quinn spoke.

He found that while those at the helm of the oil and gas, electric, and mining industry were enthusiastic about the possibilities under the new administration, they had a continuing battle to fight, something becoming ever prevalent--cybersecurity.

Edison Electric Institute CEO and USEA Board member, Tom Kuhn, said industry is facing this battle together, and it's going to take a public-private plan of action to manage physical and cyber threats. Public power companies, cooperatives, the government, and industry CEOs need to work together, he said.

“Hearing President Trump's energy policy plan is like lifting the regulatory anvil off the chest of my industry and allowing us to stand up, take a deep breath, and compete.” —HAL QUINN

Dave McCurdy, CEO of the American Gas Association, and USEA Board member, agreed. Already, the U.S. departments of Homeland Security, Energy, and Transportation have created a partnership. That needs to expand. Considering 96 percent of infrastructure is owned by the private sector, a public-private partnership is wise, he said.

American Petroleum Institute CEO and USEA Board member, Jack Gerard, underscored energy security, abundance and its positive effect on the economy at large.

"The average American family saves over \$1,300 a year as a result of affordable, reliable energy here in the United States...every consumer at the gas pump now saves \$550 in the form of lower gasoline and diesel prices," Gerard said.

There's a ripple effect that benefits the broader economy. "Industrial electricity costs to our manufacturers in the U.S. are 30-50 percent lower than their foreign competitors," he said.

The 2017 State of the Energy Industry Forum reflected a renewed sense of optimism about the new administration, capitalizing on the new era of abundance, and technology innovation to improve production and energy delivery.

USEA was fortunate to hear from leaders across the sector.

## OTHER SPEAKERS INCLUDED:

MERRIBEL AYRES, Principal – Lighthouse Consulting Group, LLC

MIKE HOWARD, President & CEO – Electric Power Research Institute

SUE KELLY, President & CEO – American Public Power Association

JIM MATHESON, Chief Executive Officer – National Rural Electric Cooperative Association

MARIA KORSNICK, President & CEO – Nuclear Energy Institute

MAJIDA MOURAD, Vice President of Government Relations – Tellurian, Inc.

DENA WIGGINS, President & CEO – Natural Gas Supply Association

DONALD F. SANTA, JR., President & CEO – Interstate Natural Gas Association of America

CHET THOMPSON, President - American Fuel & Petrochemical Manufacturers



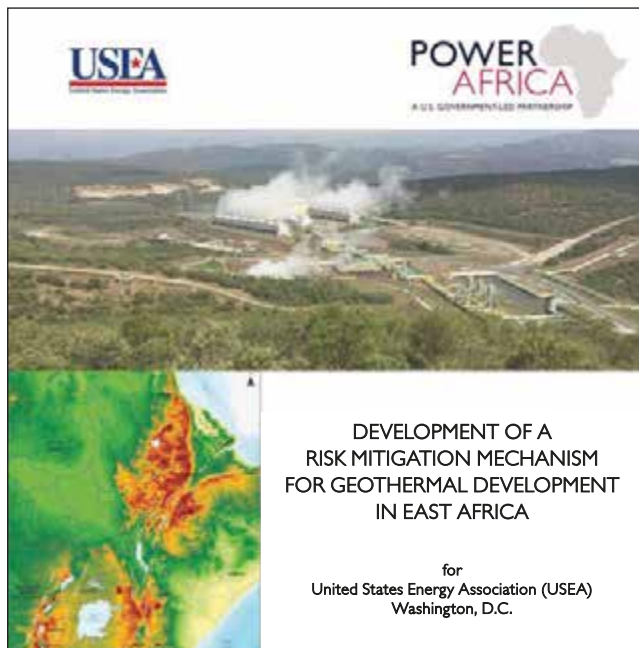
# PROMOTING RELIABLE & AFFORDABLE Energy Access

## U.S. - EAST AFRICA GEOTHERMAL PARTNERSHIP (EAGP)

### CONNECTING THE U.S. GEOTHERMAL INDUSTRY TO NEW MARKETS IN EAST AFRICA

*The U.S. Energy Association is the fulcrum of a critical public-private partnership between the U.S. Agency for International Development and the Geothermal Energy Association to help develop geothermal resources in East Africa with the larger goal of doubling energy access in sub-Saharan Africa by 2030.*

*USEA celebrated the U.S.-East Africa Geothermal Partnership's fifth anniversary in September 2017.*



EAGP helps East African nations achieve energy security through reliable, affordable, baseload geothermal energy. The partnership relies upon the world-renowned expertise of the U.S. geothermal industry and seeks to open opportunities for U.S. investment and U.S. technology exports into the East Africa Great Rift Valley.

In 2017, USEA and USAID focused on removing obstacles for geothermal development in Djibouti, Ethiopia, and Kenya.

Our team poured into these key markets help with geothermal geoscience, environmental sustainability, policy and regulatory reform, drilling engineering, power purchase agreements, geothermal reservoir management, public-private partnerships, community engagement and geothermal data management.

*With support from Power Africa, EAGP released a concept paper for reducing exploration risk in geothermal projects. The goal of GeoFutures is to drive investment in private geothermal projects and create opportunities for the U.S. geothermal industry.*





*East African geothermal executives and members of the international donor community convene in Nairobi, Kenya to launch the GeoFutures concept in March 2017.*

In April 2017, EAGP published a concept paper about a mechanism called GeoFutures Facility, which would reduce the risk associated with geothermal exploration and spur investment.

GeoFutures Facility would reduce risk by using a combination of direct finance, capacity building, technical assistance, and well productivity insurance.

The Green Climate Fund has tentatively adopted the concept, leveraging about \$200,000 of U.S. Government funding into a risk-reduction vehicle with more than \$70 million in donor funds that could enable over 1,000 MW of geothermal generation to move to financial close.



*East African geothermal experts examine U.S. geothermal technology during an EAGP trade promotion exchange in Reno, Nevada.*



# KENYA - KENGEN GEOTHERMAL PARTNERSHIP



*Geoscientists from KenGen work with Lawrence Berkeley Lab instructor Yingqi Zhang on building a geological model in TOUGH2.*

EAGP launched a geothermal partnership with the Kenya Electricity Generating Company (KenGen) in 2016 to support KenGen's efforts to develop more than 2,500 MW of additional geothermal generation capacity.

In partnership with the U.S. Department of Energy (DOE), EAGP carried out a two-prong program with Lawrence Berkeley National Labs (LBL) starting in February 2017.

A group of KenGen reservoir modeling staff traveled to LBL to take part in five-day training on U.S.-developed TOUGH reservoir modeling software.

Three of these staff members worked with lab staff for an eight-week embedded assignment to find ways to enhance the Olkaria geothermal field reservoir model and maximize development.

EAGP bought KenGen a license for the TOUGH software suite to use in Kenya for future geothermal development.

EAGP also established a partnership between KenGen, New Zealand-based Contact Energy, and two New Zealand Maori groups--Tauhara North No. 2 Trust and the Ngati Tahu Iwi--to share best practices for environmental and social engagement in geothermal power plant development.

*“ The partnership has become a model for resource development in Africa. ”*



*Olkaria Maasai Community women greet visitors from New Zealand to their village. KenGen's Olkaria 3 geothermal power plant shown in the background.*



The partnership has become a model for resource development in East Africa.

EAGP arranged four executive exchange programs in 2017 where KenGen and the Maasai community together identified ways to accelerate geothermal energy development while building capacity within the Olkaria Maasai Community to encourage financial independence.

KenGen also began developing its Community Engagement Strategy for subsequent generation projects.



Members of KenGen's Executive Team and Board of Directors learn about ways that Contact Energy works with Ngati Tahu on the conservation of sacred land and resources.

## Geothermal Cooperation in Kenya

New Zealand Shares Best Practices

BY CATLYN SMITH AND ANDREW PALMATEER

To Kenya's Maasai tribes, areas of geothermal activity within the Rift Valley hold cultural and spiritual significance. The natural heat source that flows from underground is critical to their nomadic way of life. The land above is abundant with wildlife and places of ritual. Kenya's government has recognized the importance of natural resources to the Maasai and other tribes and strives to protect tribal rights. However, Kenya is one of Africa's fastest-growing economies; the country requires continued growth in power generation capacity. How could Kenya utilize resources without infringing on cultural and spiritual beliefs?



CATLYN SMITH

Halfway around the world, New Zealand faced a similar challenge. To New Zealand's Maori tribes, geothermal resources are more than simply a source of electricity; they are a sacred gift from the gods. Maori have used natural geothermal pools for centuries to prepare food, treat illness, and to conduct religious ceremonies.

Gail Smith serves as senior program coordinator for the U.S. Energy Association, managing the U.S.-East Africa Geothermal Partnership. She works with the U.S. Agency for International Development to promote sustainable, efficient power systems and global energy security with a focus on increasing geothermal energy generation in East Africa.

Andrew Palmateer serves as program director for the U.S. Energy Association. He manages cooperative agreements with the U.S. Agency for International Development and the U.S. Department of Energy that promote sustainable, efficient power systems and global energy security.

Today, New Zealand's modern economy relies on geothermal energy for over sixteen percent of its electricity generation. Geothermal projects, if not managed responsibly, can negatively impact local populations by depleting water reserves, disrupting migratory patterns, cattle grazing, and land stability. They can also destroy significant geothermal surface features.

New Zealand has set a global standard for engaging affected communities during geothermal development. New Zealand energy utilities have successfully partnered with Maori to ensure that the rights and customs of Maori people are protected, while at the same time utilizing resources to meet the country's electricity needs.

State-owned utility company Mercury and joint venture partner Tauhara North No. 2 Trust, known as TNO2, have successfully developed geothermal resources over two geothermal reservoirs. The partners have been able to improve

### How could Kenya utilize resources without infringing on cultural and spiritual beliefs?

the well-being of their people and the wider community through environmental guardianship and economic development projects.

In Kenya, the largest power producing company in the country has encountered project delays or cancellations due to disagreements with tribal communities. The Kenya Electricity Generating Company, known as KenGen, has developed over five hundred megawatts of geothermal power generation at the Olkaria field near Naivasha, Kenya.

In addition to hosting one of the world's premier geothermal resources, Olkaria is also home to a large population of



The KenGen-supported Olkaria School is being built by the Maasai community. From left: KenGen representative and Maasai community member, Genelle Palmer, Senior Sustainability Advisor for Contact Energy, and the rest of the U.S. and New Zealand delegation to the Olkaria community. KenGen constructed the Olkaria village and continues to support its resettled residents by constructing schools, healthcare facilities, and funding scholarships and training programs.



Maasai welcome Petera Rehana, Ngati Tahu community member, Genelle Palmer, Senior Sustainability Advisor for Contact Energy, and the rest of the U.S. and New Zealand delegation to the Olkaria community. KenGen constructed the Olkaria village and continues to support its resettled residents by constructing schools, healthcare facilities, and funding scholarships and training programs.



KenGen's outstanding geothermal resources while respecting cultural heritage. From left: Albert Mugit, Chief of the KenGen Board, David Muthika, KenGen's Senior Manager, KenGen Regulatory and Chair of the Strategy Committee and Director of External Development Director.

relationships with affected communities.

Because of the Kenya-New Zealand exchange facilitated by Power Africa and the U.S. Energy Association, KenGen leadership now acknowledges that community engagement is actually good for a utility's bottom line. It is not a charitable project, or just an exercise in corporate social responsibility. Instead, early engagement with affected communities

helps utilities deliver low-cost power projects by reducing delays caused by community objections and litigation.

Historically, some management and staff considered Maasai and local populations to be adversaries or groups that stand in the way of project progress. More recently, KenGen leadership has shifted its mindset and now approaches the affected communities as partners.

The value of this unique professional exchange is encapsulated in the words of Joshua Choge, KenGen's Chairman of the Board: "The relationship we have with the communities will continue defining the growth and operations of our company."

"Contact Energy, our counterpart in New Zealand, has a global success story working harmoniously with the local Maori community over the years. We want to understand how they have done it and use this experience to improve the way we work with our communities in a win-win partnership." ♦

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prospects are underway at Elburu Lake and Magadi.

In the long run, having a strong stakeholder engagement program in place will enable KenGen to meet its corporate goals while maintaining mutually beneficial

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Partnership participants from KenGen, Contact Energy, Tauhara North No. 2 Trust and Ngati Tahu at Wairakei Power Plant in New Zealand.





# ENERGY UTILITY PARTNERSHIP PROGRAM (EUPP)

UNDER THE DIRECTION OF USAID, USEA IMPLEMENTS THE ENERGY UTILITY PARTNERSHIP PROGRAM (EUPP) TO IMPROVE ENERGY ACCESS BY FACILITATING THE TRANSFER OF BEST PRACTICES BETWEEN THE U.S. AND ENERGY COMPANIES OVERSEAS IN ASIA, AFRICA, LATIN AMERICA, AND THE CARIBBEAN.

The purpose of the EUPP is to strengthen the capacity of utilities in USAID-assisted countries to effectively manage and operate power systems, improve energy infrastructure and services, run financially viable businesses, and integrate different types of energy resources into their grid. For more than 25 years, USEA and its members have been uniquely positioned to identify potential opportunities of mutual interest and share their vast expertise with others.

The EUPP creates partnerships between the U.S. and international private sectors and USAID-assisted countries to facilitate a peer-to-peer exchange of information. These public-private partnerships rely heavily on volunteer experts and USEA

members who share best practices and describe their experiences on a broad range of issues.

In 2017, USEA was granted a new Cooperative Agreement by USAID to continue the Energy Utility Partnership Program for an additional five years. This new agreement will allow USEA to continue the longstanding program of providing capacity building to USAID-assisted countries while also increasing and strengthening U.S. investments and joint ventures in developing country energy sectors. Current countries under the new EUPP include Colombia, Kenya, Uganda, Rwanda, Ethiopia, Senegal, India, and Tanzania.

## ENGENDERING UTILITIES PARTNERSHIP

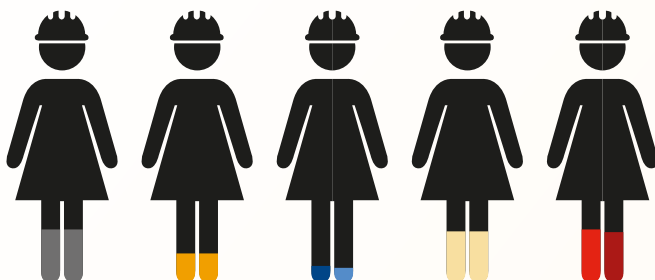
Under USEA's Engendering Utilities Partnership, a series of capacity-building activities were conducted to support Human Resource managers commissioned with implementing gender equality at their organizations. The participating utilities came from Georgia, Jordan, Kenya, Macedonia, and Nigeria.

In 2017, a final workshop was conducted to provide training on the rationale, design, development, and implementation of behavioral based interviewing. Participants learned how to execute the systematic, non-biased and objective behavior-based interview process efficiently for future interviews. A meeting was also held with ENEL in Italy to discuss their programs on diversity policies, global training initiatives, and the Global Mobility Program.

### WOMEN IN ENERGY

The Women in Energy series is a joint project between USEA and USAID that was developed out of USEA's Engendering Utilities Partnership, a program funded by USAID to improve gender policies and gender outcomes at their respective organizations. **#WomenInEnergy**

### % OF WOMEN EMPLOYEES PARTNER UTILITIES



## DJIBOUTI

### ODDEG GEOTHERMAL PARTNERSHIP



*Kayad Moussa, Director of The Office Djiboutien de Développement de l'Énergie Géothermique (ODDEG) shares a presentation on opportunities to invest in the development of Djibouti's geothermal resources. The geothermal drilling training conducted by U.S. drilling experts in December 2017 provided ODDEG's staff with the technical expertise to start drilling in 2018.*

EAGP continued its work to support the Office Djiboutien de Développement de l'Énergie Géothermique (ODDEG) in 2017.

ODDEG was established in 2014 with the mandate to serve as the country's geothermal exploration and development group.

Djibouti, a small nation located in the horn of Africa, relies primarily on diesel generation, which drives the cost of electricity to over 30 cents per kilowatt-hour.

The Government of Djibouti has prioritized geothermal power to transform the country's energy sector because it's an inexpensive baseload source of electricity.

Because long-term development of geothermal energy in the country requires the technical capacity of ODDEG's young staff, EAGP worked with U.S. geothermal drilling experts to lead 24 ODDEG engineers and technicians through a geothermal drilling training.

ODDEG's team will begin drilling wells in the Gale La Goma region of Djibouti in 2018.

## ETHIOPIA

### SUPPORTING GSE AND EEP

The Government of Ethiopia plans to develop over 2,000 MW of public and private geothermal projects by 2030.

With a long history of geothermal exploration, but only one installed geothermal pilot plant, Ethiopia is eager to diversify its heavily hydroelectric generation mix with clean, inexpensive baseload geothermal generation.

*EAGP continued its support to the Geological Survey of Ethiopia (GSE) to overhaul its geothermal databases and data collection practices. U.S. experts work with GSE staff to improve geothermal databases useful for private developers seeking sites for exploration.*



The East African nation relies on its hydroelectric plants for its generation; About 94 percent of its electricity is generated by those plants.

But droughts in recent years have led to power shortages. To sustain a national economic growth rate of 10.5 percent, it is critical to continue adding a variety of power generation to its grid to reduce the heavy dependence on hydroelectric power.

In 2017, EAGP provided the Government of Ethiopia with capacity building and technical assistance, and recorded an important milestone—an \$8 million grant for geothermal exploration from the Geothermal Risk Mitigation Facility for East Africa (GRMF).

EAGP brought in technical and commercial experts to support the Government of Ethiopia in developing its first successful GRMF application.

# WHERE WE MAKE



		
<b>USAID</b>	<b>WEC</b>	<b>DOE</b>





# AFGHANISTAN

## DEVELOPING A NATIONAL ELECTRICITY REGULATORY AGENCY

Working with USAID to assist Afghanistan's electricity sector, USEA implemented a U.S. – Afghanistan Utility Partnership in 2013 focused on utility best practices in power generation, transmission, and distribution with Afghanistan's state-owned electricity utility, Da Afghanistan Breshna Sherkat (DABS). In May 2017, USEA conducted the final activity under the partnership for DABS and Afghanistan's Ministry of Energy and Water (MEW), along with an executive exchange to New Delhi and Gujarat, India to meet with India's state and federal electric utilities and regulators to discuss their regulatory framework.

The delegation focused on procedures for issuing licenses concerning the generation, distribution, and transmission of electricity, the structure of the Indian electricity regulatory body, and India's model for constructing a nationally-synchronized grid.



*Afghanistan delegates visit the Gujarat Energy Transmission Corporation, Ltd. in Vadodara, India, to discuss maintaining stability of the grid and interaction with the state regulator and national regulator.*

# TANZANIA

## PROMOTING SUSTAINABLE ENERGY SECTOR GOVERNANCE IN TANZANIA

In partnership with USAID's Power Africa initiative, USEA provides capacity building support to the Tanzania Electric Supply Company (TANESCO), the Zanzibar Electricity Corporation (ZECO) and the Tanzania Petroleum Development Corporation (TPDC).

Under this partnership, USEA conducted four activities in 2017:

- Key stakeholders from Tanzania traveled to Brazil on an executive exchange to meet with principal stakeholders, government entities and private sector companies involved in Brazil's reverse power auctions. The groups discussed reverse power auctions, power purchase agreements, project finance, national energy planning and procurement, competitive bidding processes and prequalification.
- A workshop held in Arusha, Tanzania regarding project and contract management for members of Tanzania's energy sector. Participants focused on drafting and negotiating contracts, project management, dispute resolution, and procurement best practices.
- An executive exchange to Indonesia held for members of Tanzania's Gas Negotiating Team (GNT) on LNG policy and management. The GNT met with key stakeholders in Indonesia to discuss Indonesia's experience with developing its LNG industry. The delegation had the opportunity to visit a floating regasification LNG unit.
- Tanzanian Members of Parliament (MP) who sit on the Parliamentary Energy Committee visited Washington, DC and Minneapolis, MN to learn about sustainable energy sector governance. This executive exchange exposed the members to energy policy, planning, and governance while providing the opportunity to visit a wind farm outside of Minneapolis.

# EATP CONCLUSION AND HANDOVER OF EATP MODEL TO EAPP

With the support of USAID, the Eastern Africa Power Pool (EAPP) Planning Committee and USEA conducted its final regional Working Group Meeting of the Eastern Africa Transmission Planning Partnership (EATP) and training program in Addis Ababa, Ethiopia in July 2017. Since its launch in 2015, the EATP program has succeeded in providing 3,200 hours of regional training in electricity transmission system network modeling, planning and analysis to transmission system engineers. Organizations included Eastern Africa Power Pool (EAPP), Ethiopian Electric Power (EEP), KETRACO, Kenya Power (KPLC), Tanzania Electric Supply Company, Ltd (TANESCO), Régie de Production et Distribution d'Eau et d'Electricité (REGIDESO), Rwanda Energy Group (REG Ltd.), Uganda Electricity Transmission Company, Ltd. (UETCL), and Nile Equatorial Lakes Subsidiary Action Program (NELSAP). With the conclusion of the EATP, the electricity transmission system planning regional model and model standard operating procedures officially transferred to the Eastern African Power Pool, the regional model coordinator.



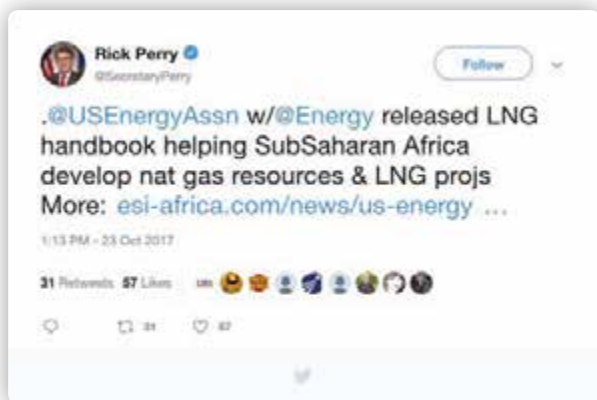
## WORKSHOP ON SHARING NATURAL GAS DEVELOPMENT EXPERIENCES:

### UNDERSTANDING NATURAL GAS AND LNG OPTIONS OCTOBER 23, 2017 in Cape Town, South Africa

The USEA, in partnership with Power Africa and the U.S. Department of Energy's Offices of Fossil Energy and International Affairs, brought together top technical and legal experts in natural gas and liquefied natural gas (LNG) development to create a comprehensive handbook on "Understanding Natural Gas and LNG Options." The handbook was created to help senior civil servants in sub-Saharan African nations understand the fundamentals of natural gas development and LNG transport. Following the launch of the handbook, USEA organized a workshop in Cape Town, held alongside Africa Oil Week.



*Secretary Perry highlights the importance of U.S. gas exports during remarks at a workshop on LNG development in Cape Town, South Africa.*



U.S. Department of Energy Secretary, Rick Perry, co-hosted the workshop with Power Africa Coordinator, Andy Herscowitz,

who brought together public and private institutions to discuss the opportunities and challenges of natural gas development in Sub-Saharan Africa. In his remarks, Secretary Perry celebrated how the U.S. will become a net energy exporter due to ingenuity and innovation across the board in an all of the above energy revolution.

Natural gas development and LNG imports can help many countries in Africa to meet soaring domestic energy demands while also providing critical revenue for developing countries through the export of LNG to global markets. The handbook dives into the impacts of pursuing specific project development models, technical capabilities required to develop projects, and the tradeoffs between gas-to-power projects and LNG exports.



# IMPROVING RELIABILITY & *Efficiency*

## SENEGAL

### ENHANCING TRANSMISSION OPERATIONS

Through the Senegal Utility Partnership, USEA assists the national utility, Societe Nationale d'Electricite du Senegal (SENELEC), in improving the reliability of their interconnected network by devising a strategy to address their outages.

In 2017, USEA coordinated with a consultant to perform validation and performance testing on six power plants in Senegal to characterize the dynamic performance of the equipment and to develop simulation models for stability studies. The simulation models will be crucial in determining what settings ensure optimal performance of power generation equipment and transmission network behavior.

Through this process, verification and validation of generation models were developed to assist Senelec with identifying technical requirements for the connection of power plants to the transmission system. This study is the beginning of other planned capacity building programs in Senegal aiding the executives responsible for the country's generation projects.

## HAITI

### IMPROVING LOSS REDUCTION AND STRENGTHENING REGULATORY STANDARDS

In collaboration with USAID, EUPP assists the Government of Haiti in reducing technical and non-technical losses from their distribution system as well as supports the development of Haiti's new energy regulatory agency, l'Autorité de Régulation du Secteur de l'Energie (ANARSE).

To promote bilateral cooperation between island nations, USEA brought together representatives from Haiti and Jamaica to share best practices on developing a regulatory agency in the Caribbean. The Haitian delegates met with their Jamaican counterparts to provide advice on the development of an electricity regulator and reforming the Haitian utility,



Electricite d’Haiti (EDH). Participants involved were the Jamaican Public Service Company Ltd. (JPS), the Jamaican Office of Utilities Regulation (OUR), and the Jamaican Ministry of Science, Energy, and Technology (MSET).

In March 2017, USEA hosted an “Energy Dialogue on Metering, Billing, and Loss Reduction” for the mayors of the Haitian provinces. Representatives from several international utilities and NGOs presented best practices on solving issues involving theft and collection and billing. The workshop hosted international speakers representing the national electric utilities of El Salvador, South Africa, Columbia, Jamaica, Spain, and the Dominican Republic.

## ETHIOPIA

### TRAINING ON SUBSTATION MAINTENANCE

EUPP trains the Ethiopian Electric Utility (EEU) on substation operations and maintenance to improve their operations and reliability as they expand access.

- In October 2017, USEA facilitated the second Substation Operation and Maintenance Training for EEU. The objectives of this training were to enhance professional skills essential for the safe and efficient operation and maintenance of a distribution substation. The training focused on maintenance and testing requirements for common substation devices. Based on the results of the assessments, the practice had an average impact of 30 percent with the most considerable improvement in the target area of safety (46 percent). EEU has access to two manuals to improve practices: a Training Manual for Substation Maintenance Program and a Training Manual for Maintenance Protocol & Tests.
- In November 2017, USEA facilitated leadership training for top Ethiopian Electric Utility executives. The five-day program was designed to give the seven senior managers a solid understanding of management and leadership and the



opportunity to discuss and develop strategic plans for changes occurring within the company. Key areas of the discussion revolved around topics such as management and leadership, top down and bottom up management, delegation and time/task management, and communication.

## NELSAP

### WORKSHOP ON CONTRACT AND PROJECT MANAGEMENT

In July 2017, USEA organized the third Nile Equatorial Lakes Subsidiary Action Program (NELSAP) workshop on contract project management for Eastern African utilities and regional organizations. Participants included representatives from the Eastern Africa



Power Pool (EAPP), Ethiopian Electric Power Company (EEP), Ethiopian Electric Utility (EEU), Kenyan Electricity Transmission Company Limited (KETRACO), the Nile Basin Initiative/NELSAP, Rwanda Energy Group (REG), Tanzania Electricity Supply Company (TANESCO) and Uganda Electricity Transmission Company Limited (UETCL). The five-day workshop was designed to follow the natural flow of a transmission line construction project, starting with step-by-step bid/tender process; vendor requirements and bid evaluations; contract development; contract negotiations and performance management; and contract modification, termination, and closeout.



# ENERGOPRO FIVE-YEAR NETWORK



In partnership with the USAID Energy Technology and Governance Program, USEA provided technical assistance and network modeling software to Energo-Pro, the largest electric distribution utility in the Republic of Georgia, to help develop the Five-Year Network Development Plan. This plan is a requirement of the Georgian National Energy Regulatory Commission and complies with the Southeast Europe Energy Community Treaty.

The project included the provision of the Power Factory DigSilent distribution network modeling software accompanied by a series of five technical training workshops and internships designed to build institutional capacity.

*USEA Senior Director, Will Polen, provides three licenses of the Power Factory DigSilent distribution network modeling software to Mikheil Botsvadze, General Director of EnergoPro and the largest electric distribution utility in the Republic of Georgia.*



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## SOUTHEAST EUROPE COOPERATION INITIATIVE (SECI) TRANSMISSION SYSTEM PLANNING PROJECT HANDOVER

### USAID, USEA TURN OVER SECI PROJECT TO EUROPE, COMPLETES EMBLEMATIC DEVELOPMENT PROJECT

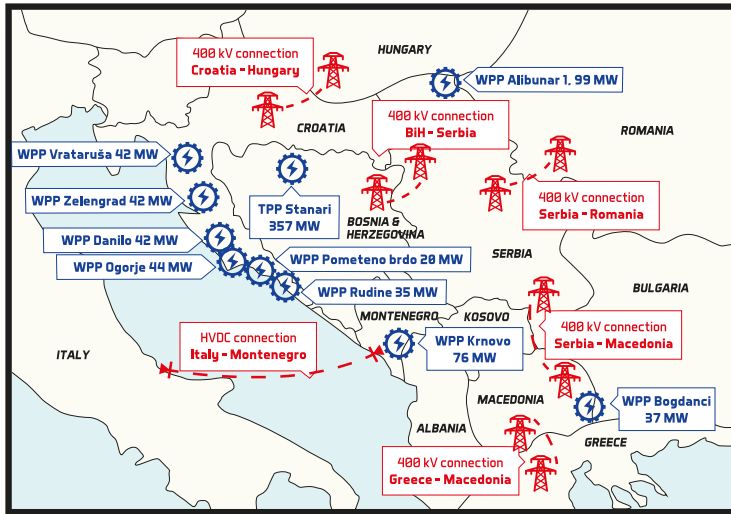
OCTOBER 24, 2017

After 16 years, USEA and USAID brought the Southeast Europe Cooperation Initiative (SECI) Transmission System Planning Project to completion and turned over the region's transmission system management to the European Network of Transmission System Operators of Electricity (ENTSO-E).



Borne from the ashes of the Balkans War, SECI was a multinational effort among national transmission utilities in Albania, Bosnia and Herzegovina, Bulgaria, Croatia, Kosovo, Macedonia, Montenegro, Romania, and Serbia, managed and funded by USAID and USEA. Under SECI, the nine countries developed an electricity network planning model enabling utilities, policymakers, and regulatory authorities to efficiently plan for various power sector development scenarios.

*Steve Burns, USAID Chief of Energy and Infrastructure for Europe and Eurasia, turns over SECI project to Europe in completion of the emblematic development project.*



The models or scenarios reveal how renewable energy generation can safely and reliably add to the regional grid, the effect energy efficiency will have on electricity trade, and the potential to establish new connections with European wholesale electricity markets. With the provision of advanced network planning software and extensive training supported by USAID and USEA, SECI has endowed Southeast Europe with a sustainable, regional network planning capacity. The SECI models are deemed to be the most comprehensive and authoritative in Europe. Their use in network planning studies is estimated to have already leveraged more than \$1 billion in new electric power generation, and transmission investment in Southeast Europe with several billion dollars of potential projects queued or under consideration.

The models produced by SECI serve a far greater purpose than simply serving as a basis for network analyses. Equipped with a common planning platform developed in an open, transparent and cooperative manner, the participants of the SECI project possess a common “electrical” language in which they converse. They are free to explore the benefits of regional cooperation that will bring greater efficiency to electricity trade and improved power quality to electricity consumers throughout the Balkans.

SECI has taken its rightful place as a European planning authority within the framework of ENTSO-E. ENTSO-E is responsible for ensuring electric reliability and fostering competitive wholesale electricity markets from Lisbon to the borders of Poland. While it already bears a mantle of great responsibility and authority, its adoption of the SECI Working Group portends greater integration of Southeast Europe with the European grid and electricity markets. USEA hopes that as SECI continues to work toward these goals within the ENTSO-E framework, the legal, regulatory and commercial ties between the power sectors of Southeast Europe and the European Union will get stronger and advance our shared Euro-Atlantic objectives.



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## BLACK SEA TRANSMISSION PROJECT AND STATION VISIT

With the support of USAID, USEA established the Black Sea Regional Transmission Planning Project (BSTP) as a regional approach to transmission system network planning, identifying priority transmission investments, enhancing electric power trade, harmonizing planning principles and promoting analysis results to policy and regulatory authorities.

In 2017, the BSTP conducted an intensive workshop on Net Transfer Capacity (NTC) calculations and Modeling High Voltage Direct Current (HVDC) Converter Stations to continue building institutional capacities within the Black Sea Regional Transmission Planning Project Transmission System Operators. The workshop was followed by a visit to the Akhaltsikhe High Voltage Direct Current Substation located in the Republic of Georgia.







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## SOUTHEAST EUROPE DISTRIBUTION SYSTEM OPERATOR SECURITY OF SUPPLY WORKING GROUP (DSO)



The Southeast Europe Distribution System Operator Security of Supply Working group (DSO) was established in July 2013 by USAID, USEA, and the distribution system operators of Southeast Europe. The Working Group improves the security of electricity supplied by DSOs in Southeast Europe. Countries include Albania, Bosnia and Herzegovina, Croatia, Kosovo, Macedonia, Montenegro, Serbia, and as an observer, the Republic of Georgia.

The Working Group focuses on developing national and regional emergency preparedness and response mechanisms following the increasingly frequent weather-related events that have jeopardized electricity service to end-use customers. In FY 2015 (updated in 2017) The Working Group completed a landmark regional

benchmarking study of weather and non-weather related system outages which is used by the member DSOs to define the extent of lapses in their electricity supply.

In 2017, the Working Group completed the second phase of the Benchmarking Analysis with over 100 key performance indicators. It also initiated a study on distribution efficiency to help utilities in the region comply with European Union directives.

## MOLDOVA RECEIVES SOFTWARE FOR EUROPEAN INTEGRATION STUDIES

With the support of USAID, USEA established the Black Sea Regional Transmission Planning Project (BSTP) as a regional approach to transmission system network planning. In 2017, the BSTP procured a second license for the high-performance transmission planning and analysis software, Power System Simulator for Engineering (PSS®E), to the Moldovan Transmission System Operator, Moldelectrica. As part of the BSTP project, the software will enable Moldelectrica to take an increasingly active role in regional transmission planning analysis, including studies for the synchronous connection of its network to the ENTSO-E synchronous zone.



# ENERGY SECURITY & Trade

## SOUTH ASIA REGIONAL INITIATIVE FOR ENERGY INTEGRATION (SARI/EI)

The USAID SARI/EI program focuses on three key areas while promoting energy security in South Asia: Cross-border energy, trade energy market formation, and regional clean energy development. As one of the implementing partners of SARI/EI, USEA executed a series of activities in 2017 under the EUPP umbrella. These activities focused on the sharing of best practices in operations, cross-border electricity trade, electricity markets and planning, and improving regional energy cooperation and energy integration in the region.

A 2017 highlight included a five-day executive exchange for Nepalese members of Parliament and executives from the Investment Board Nepal. Vietnam shared its experiences regarding the planning, appraisal, financing, development, risk mitigation, structuring, and operations involved with extensive hydropower production.



*Parliamentarians visit the recently completed 260 MW Trung Sơn hydropower project (above left), owned by the Trung Sơn Hydropower Company Limited (TSHPCo) (under EVN) and largely financed by the World Bank. Thanh Sơn Hydropower (above right) was the second site the delegation visited. Thanh Sơn is under construction by a private developer, with a planned capacity of 30 MW.*





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## USAID / USEA LAUNCH EASTERN EUROPE NATURAL GAS PARTNERSHIP

To inaugurate the Eastern Europe Natural Gas Partnership between USAID and USEA, natural gas system operators (TSOs) and Ministries of Energy in Albania, Bosnia Herzegovina, Bulgaria, Croatia, Kosovo, Macedonia, and Montenegro signed the Zagreb Memorandum of Understanding in 2017. The agreement requires participating countries to share system data and cooperate in the development of a common regional pipeline network planning model.

USEA provided participating transmission system operators with the SIMONE natural gas pipeline modeling software and conducted a three-day training course for NGP members.

The national network planning models are integrated into a single regional planning model and are distributed to members of the Working Group, providing them with the region's first common planning model. The model is used by participating system operators to conduct technical and economic analyses needed to

optimize the build-out of domestic natural gas pipeline networks. The model also assesses the interconnections between countries required to transport new sources of natural gas expected to deliver to the region.

“*The model will be used by participating system operators to conduct technical and economic analyses needed to optimize the build out of domestic natural gas pipeline networks and interconnections between countries required to transport new sources of natural gas expected to be delivered to the region.*”

The regional model which was completed by the end of 2017, allows members of the Working Group to communicate recommendations resulting from the analysis to policymakers, regulators international financial institutions and the donor community to accelerate investment in new pipeline infrastructure.

### NGP SIGNING CEREMONY

*Representatives from Albqaz, BH-Gas, Plinacro, Kosovo Ministry of Economic Development, GA-MA AD, Montenegro Bonus and USEA sign the NGP Memorandum of Understanding.*



*Julieta Valls Noyes, U.S. Ambassador to Croatia, emphasizes the importance of regional cooperation.*





# WASP-IV LEAST COST GENERATION PLAN TRAINING FOR GEORGIAN STATE ELECTROSYSTEM (GSE)

USEA and USAID organized a two-week training course on the Wien Automatic System Planning Package (WASP-IV) to help GSE staff evaluate technical and economic characteristics of future power generation options to satisfy electricity demand. The training course also helped GSE develop a Ten Year Network Development Plan.

The GSE team is now equipped with various power system assessment tools (i.e. VALORAGUA, WASP, GTMax, EMCAS and PSS/E) that can be used in an integrated and iterative approach to develop complex analysis and support decision making related not just only to transmission network, but overall development of the power sector (e.g. development of power generation master plan / study for which main structure was presented and transferred to the team). Institutional framework for energy planning, division of duties, and responsibilities between stakeholders in market environment is still under creation (i.e. responsibilities of ministry, regulator, transmission system operator, generators, market operator and distribution/supply) and it appears there is no analytical group (formal or informal) inside public institutions that can provide internal support to the government. The GSE team can help decision and policymakers analyze and develop sustainable long-term energy and electricity supply strategies.

## USEA LAUNCHES THE UTILITY CYBER SECURITY INITIATIVE (UCSI) WORKING GROUP

In 2017, USAID and USEA worked with information technology specialists of the Black Sea region to establish the Utility Cyber Security Initiative (UCSI) Working Group.

The group includes national and regional transmission and distribution system operators from Armenia, Georgia, Moldova and Ukraine.

The UCSI Working Group aims to help information technology specialists working in Europe and Eurasia utilities recognize potential cyberattacks, and develop model transmission and distribution utility roadmaps.

The Working Group established these goals to implement procedures and deploy investments that would improve resiliency and harden utilities against future attacks.



In late 2016, USAID requested USEA organize a workshop to:

- Make transmission system operators aware of the vulnerabilities to their grid
- Demonstrate how U.S. utilities, RTOs and ISOs organized their early efforts to evaluate vulnerabilities
- Help E&E utilities develop a roadmap to evaluate and take the first steps toward defending their systems

The UCSI Working Group held its inaugural meeting in June 2016 in Kiev, Ukraine.

The workshop included over 50 participants and featured volunteer participation from European and U.S. transmission and distribution utilities.

Independent system operators and standard setting organizations, including the North American Electric Reliability Corporation (NERC) and the European Network of Transmission System Operators of Electricity (ENTSO-E), also attended.

The three-day workshop provided participants with a 360-degree perspective on policy directives, regulatory framework, technology standards, best utility management practices, and emerging cyber security grid technologies.

# CROSS BORDER BALANCING SERVICES IN THE BLACK SEA REGION



With the support of USAID and the National Association of Regulatory Commissioners (NARUC), USEA conducted its seventh joint project coordination meeting in Kiev, Ukraine. During the coordination meeting, the group launched its next phase of collaboration: Analysis of the Potential to Provide Cross-Border Balancing Services and Energy in the Black Sea Region. The Study utilizes the BSTP regional transmission

system planning model by applying a methodology for the assessments of cross-border balancing cooperation among the region. The study identifies policy and regulatory gaps and recommends policy measures and milestones to further the development of liberalized electricity markets in the Black Sea region.



## USEA MEMBER SCHWEITZER ENGINEERING LABORATORIES TAKES LEAD ROLE IN UTILITY CYBER SECURITY INITIATIVE

USEA and USAID created the Utility Cyber Security Initiative (UCSI) Working Group with utilities of the Black Sea region to spur new policies and technical standards, and unearth utility management best practices to help protect the region's grid.

The Initiative also helps deploy emerging technologies to protect Black Sea utilities from cyberattacks.

The Working Group met in Vienna, Austria in October 2017.

Washington State-based Schweitzer Engineering Laboratories led the meeting with presentations to more than 50 utility executives.

CEO Ed Schweitzer III and four of his Schweitzer Engineering colleagues talked about securing control systems and structuring a strong and robust cyber security model.

They presented several ideas including: a six-level approach to implementing a security model across the organization and its operational networks; technical steps to document system assets; quick recognition of a cyber security event and how to prepare, respond and recover; and how a strong security model fulfills, assists, and facilitates regulatory compliance.



# CLEAN ENERGY *Integration*

## GREENING THE GRID (GTG) INDIA SYSTEM OPERATORS PARTNERSHIP

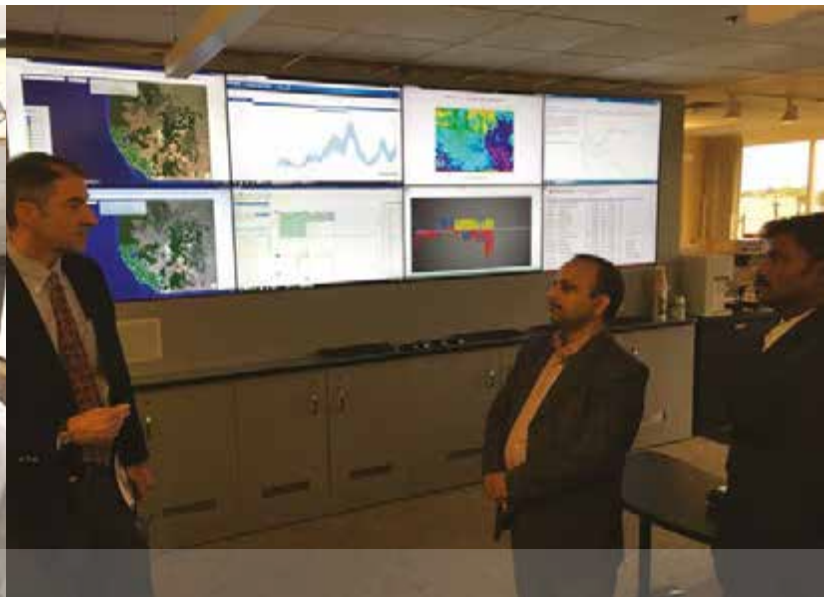
USAID's Greening the Grid (GTG) is conducted in partnership with India's Ministry of Power (MOP) under the U.S. – India Partnership to Advance Clean Energy Deployment (PACE-D). This program aims to support the Government of India's efforts to manage large-scale, variable renewable (VRE) integration into the grid. Under GTG, USEA implements a series of activities to support system operators from the national, regional, and state load dispatch centers. USEA focuses on sharing transmission system operation and planning best practices for VRE integration into the power grid.

- USEA conducted a workshop in New Delhi on ancillary markets for Power System Operation Corporation Limited, the state load dispatch centers, and the Central Electricity

Regulatory Commission. The workshop focused on services to support the transmission of electric power from seller to purchaser. In systems with significant variable renewable



*Bob Staton of Xcel Energy conducts a peer review of the Karnataka State Load Dispatch Center.*



*Central Electricity Regulatory Commission (CERC) Secretary SK Jha (right) at PacifiCorp's system control room.*



energy penetration, such as the western and southern regions of India, ancillary services will be a vital tool to manage increased variability and uncertainty. Through the workshop, participants gained a greater understanding of the variety of ancillary services available, such as regulation and operating reserve, energy imbalance, the cost-based services of scheduling, system control and dispatch, voltage control and black start.

- In May 2017, USEA hosted Indian officials and system operators to examine U.S. approaches to enabling the economic dispatch of renewable energy, expanding coordination in operations, and improving resource flexibility. The Indian executives visited the California Independent System Operator, the California Public Utilities Commission, Electric Reliability Council of Texas, the Oregon Public Utility Commission, PacifiCorp, Portland General Electric,

and Xcel Energy. Discussions focused on VRE balancing, storage, and demand-side approaches; challenges of implementing various grid code and reliability standards; regional transmission planning, dispatch and markets; and real-time monitoring using advanced control technologies to allow coordination from central headquarters for more efficient dispatch of renewable energy generation.

- In June 2017, Bob Staton of Xcel Energy and consultant Mark Edstrom of EHA+Company conducted peer reviews for the Gujarat and Karnataka state load dispatch centers. Americans met with the control center staff to discuss the challenges facing the Indian system operator and share mutual experiences. Topics included reliability tools, communication methods, testing and monitoring, training, procedures and operating guidelines.

## E3/WORLDWIDE

### REVERSE AUCTIONS FOR RENEWABLE INTEGRATION

In 2017, USEA facilitated the “Kazakhstan Renewable Energy Exchange” for key stakeholders involved in planning Kazakhstan’s first energy auction. In Mexico, the activity sought to introduce participants to Mexico’s experience with energy auctions and how to identify best practices. In the U.S., delegates learned about the latest renewable energy development and integrating renewable power sources with the electric grid, specifically wind. Participating stakeholders included the Ministry of Energy of the Republic of Kazakhstan, Kazakhstan Electricity Grid Operating Company (KEGOC), Kazakhstan Operator of Electric Power and Electric Energy (KOREM) and the Financial Settlement Center of Renewable Energy Sources.



# COLOMBIA

## INTEGRATING RENEWABLES

USEA began partnering with Colombia's system operator, XM, in November 2017 to provide capacity building to support XM's efforts in eliminating the barriers to non-conventional renewable integration in Colombia. The capacity building includes recommendations to update Colombia's grid code and the sharing of best practices for integrating variable renewables between U.S. system operators and XM. The first activity involved U.S. experts reviewing XM's grid code proposal and forecasting trial proposal. The final resolution will include recommendations from U.S. experts once completed. Future goals for the partnership include working on intraday markets, energy auctions, and helping distributors adopt best practices for DER in their business plans.

# GHANA

## U.S. EXPERIENCE ON SYSTEM INTEGRATION

Representatives from Ghanaian utilities participated in an executive exchange concerning Integrated Resource and Resilience Planning (IRRP) to discuss ways U.S. utilities have planned renewable energy integration. The Ghanaian delegation met with U.S. utilities, independent operators, state regulators and international development agencies in Chattanooga, TN, Sacramento and San Francisco, CA, and Washington, DC. Delegates from the Ghana Grid Company, Electricity Company of Ghana, Bui Power Authority, Volta River Authority, Northern Electricity Distribution Company, the Ministry of Energy, and the Energy Commission participated in the exchange. Topics included:

- Integrated resource planning
- Load and supply forecasting
- Integration of renewables
- Transmission system planning



*Ghanaians meet with the California ISO to discuss planning and dispatch challenges with large penetration of renewables.*

# INDONESIA

## INTEGRATING RENEWABLES



In 2017, USEA conducted an executive exchange to California with representatives of the Indonesian national utility, PT PLN (Persero), and the Ministry of Energy and Mineral Resources as part of the PT PLN–Clean Energy Development Program. The exchange was part of an ongoing partnership to explore best practices for integrating clean energy projects into Indonesia's energy portfolio and help reduce reliance on diesel generators. This executive exchange provided the Indonesian delegation with insight into California's renewable energy portfolio along with its clean energy initiatives.

PLN held meetings during the exchange with the California Public Utility Commission (CAPUC), Pacific Gas and Electric (PG&E), the California Energy Commission (CEC), the California Independent System Operator (CAISO), and the Sacramento Municipal Utility District (SMUD).

# CONTRIBUTING to NATIONAL Goals

## CARBON SEQUESTRATION LEADERSHIP FORUM

MAY & DECEMBER 2017 in Abu Dhabi, UAE

FOR MORE THAN A DECADE, USEA HAS LED THE U.S. ENERGY DEPARTMENT'S CARBON SEQUESTRATION LEADERSHIP FORUM (CSLF), A MINISTERIAL-LEVEL INITIATIVE WHOSE GOAL IS TO ADVANCE GLOBAL ADOPTION OF CARBON CAPTURE UTILIZATION AND STORAGE TECHNOLOGIES.



*In May 2017, USEA visited Al Reyadah, UAE's first carbon capture and sequestration facility, a joint venture between Masdar and Abu Dhabi National Oil Company. The facility captures emissions from the Emirates Steel plant in Mussafah and transports that CO2 to nearby oil fields for enhanced oil recovery.*

USEA EXECUTIVE DIRECTOR BARRY WORTHINGTON LEADS THE CSLF STAKEHOLDER PROCESS, ASSEMBLES LEADERS FROM WORLD REGIONS AND ACTS AS A LIAISON BETWEEN THE U.S. GOVERNMENT, ENERGY MINISTRIES AND INDUSTRY TO HELP SHARE BEST PRACTICES, ADVANCE INVESTMENT IN, AND ADOPTION OF, CLEAN ENERGY TECHNOLOGY.



*Worthington joined world energy leaders and DOE Energy Secretary Rick Perry for the CSLF ministerial in Abu Dhabi in December 2017. USEA presented findings from a year-long effort to mobilize Regional Champions to drive the adoption of CCS technology.*





“ We want to reduce emissions and manage our energy resources in a responsible way. That doesn’t mean an end to fossil fuels. It means an increase in efficiency, clean energy technology and identifying the right areas for the various types of energy. ”

-BARRY WORTHINGTON

USEA organized a technical tour with the U.S. Department of Energy for the Republic of Korea delegates that included visits to: the Petra Nova Capture Facility and EOR Site, University of Texas at Austin’s Gulf Coast Carbon Center’s pilot amine-based capture plant, and National Energy Technology Laboratory.

## UNITED NATIONS ECONOMIC COMMISSION FOR EUROPE (UNECE)

In June 2017, USEA Executive Director Barry Worthington attended the Forum on Energy for Sustainable Development in Astana, Kazakhstan. In October 2017, Worthington chaired the 13th Session of the Group of Experts on Cleaner Electricity

Production Committee on Sustainable Energy in Geneva, Switzerland. Based on several discussions USEA prepared a list of guidelines to finance new fossil projects worldwide. UNECE committees are currently refining those guidelines.

## CLEAN COAL INDUSTRY FORUM 2017

DECEMBER 30, 2017 in Morgantown, WV



U.S. and Chinese industry and government executives convened in West Virginia for the Clean Coal Industry Forum to address key issues in the clean coal sector, foster cooperation and expand business opportunities between the two countries.

USEA organized the meeting with the U.S. Energy Department, the National Energy Technology Laboratory, West Virginia University, the China Coal Information Institute, and the National Energy Administration of the People’s Republic of China.

The meeting brought together leaders from industry, government, academia, consulting firms, non-governmental organizations, and the media to examine opportunities for joint research, technology development and commercial collaboration.



## The Council aims to promote the sustainable supply and use of energy for the greatest benefit of all people

USEA is the U.S. member of the World Energy Council (WEC), the accredited energy body of the United Nations. Since USEA was founded in 1924 as the U.S. Member Committee to the World Energy Council, it has pursued a core mission to “*promote the sustainable supply and use of energy for the greatest benefit of all.*”

Objectives we strive to achieve:

- To support the objectives of the WEC and the interests of USEA’s members.
- To bring about a better understanding of domestic and international energy issues.
- To maintain liaison with other WEC Member Committees, and create organizational and personal relationships internationally.
- To recognize individuals and organizations whose contributions enhance global understanding of energy issues.

USEA is responsible for coordinating U.S. participation in WEC events and activities. We also provide leadership on several WEC committees and studies groups, including the WEC Cleaner Fossil Fuels Systems Committee Secretariat.



The World Energy Council’s Secretary General, Dr. Christoph Frei, revealed the results of the **2017 World Energy Issues Monitor** at a USEA briefing in April 2017.

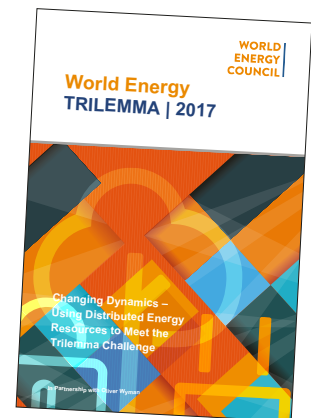
The 2017 report assesses the degree of impact and uncertainty around more than 40 key issues in the energy sector in four categories: **Macroeconomic risks, Geopolitics and Regional Issues, Business Environment, and Energy Innovation and Technologies.**



Frei also discussed the findings of the **World Energy Trilemma Index**, which reveals how the U.S. ranks among 125 countries on energy security, energy equity, and environmental sustainability. In 2016, the U.S. ranked among the top 10 in energy security.

Source:

<https://www.worldenergy.org/news-and-media/news/world-energy-council-unveils-2017-issues-monitor-report-in-washington/>



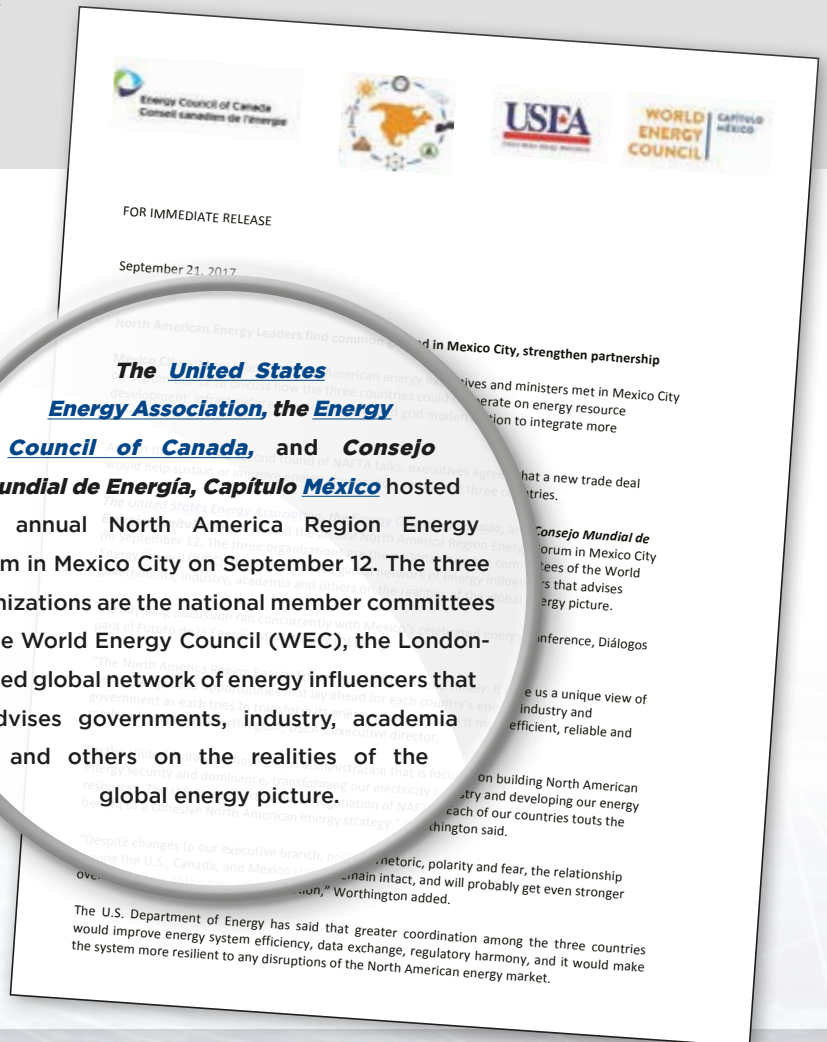
The survey showed that executives were also concerned about the impact of commodity price volatility on investment decisions, including in oil production, with heightened awareness of influence of “peak demand” and “stranded resource” concepts.

**USEA** SUPPORTS THE MISSION OF THE **WORLD ENERGY COUNCIL**, “*to promote the sustainable supply and use of energy for the greatest benefit of all.*”





USEA joins Francisco Barnes de Castro, former president of the National Autonomous University of Mexico; Rajendra Pachauri, former chairman of the U.N. Intergovernmental Panel on Climate Change (IPCC) and 2007 Nobel Peace Prize winner; Ash Pachauri, Board member, World Sustainable Development Forum, senior mentor, Protect Our Planet, Inc.





# THE AGE OF Abundance: A YEAR WITH THE EXECUTIVE DIRECTOR

“America’s energy industry is on track to meet former President Obama’s global climate goals without the Paris Accord and without the Clean Power Plan, the would-be vehicle to meet the targets outlined in Paris.”

-BARRY WORTHINGTON



The U.S. Energy Association’s executive director, Barry Worthington, joined industry leaders and Trump administration officials at global climate talks in Bonn to discuss the critical role of fossil fuels to meet the growing global energy demand.





### Energy People: Barry Worthington



**Barry Worthington** is the Executive Director of the United States Energy Association (USEA), the US Member Committee of the World Energy Council. USEA has over 100 member companies across the U.S. energy sector, from the largest Fortune 500 companies to small energy consulting firms. Mr. Worthington represents the broad interests of the U.S. energy industry and works with domestic and international energy leaders to advance international partnerships to develop energy infrastructure projects across the world.

**At the end of the day we're going to see that the new president is an 'all of the above' energy guy.**

**Barry Worthington with Steve Mirkin**

## USEA's Worthington Tells Fox Business Tragic Hurricane Season Has Revealed The U.S. Needs All Types Of Energy

“ We need to protect our energy resources, including our fossil fuels, and we need to increase our investment in the electric grid. Hurricane Harvey knocked out a quarter of the world's refining operations and shrunk gasoline supplies critical to the daily lives of our citizens. ”

-BARRY WORTHINGTON



**USEA**  
**POTENTIAL**  
**MEDIA REACH**  
 IN 2017



**284.39M**  
**241.23M**

■ USEA | News  
 ■ Barry Worthington | News

BARRY K. WORTHINGTON



*Executive Director*

BRIAN KEARNS



*Chief Financial Officer*

WILL POLEN



*Senior Director*

MARJORIE JEAN-PIERRE



*Program Director*

ALBERT DOUB



*Program Director*

ANDREW PALMATEER



*Program Director*

DIPKA BHAMBHANI



*Director of  
Communications*

SHARON LUCAS



*Senior Accounting  
Coordinator*

ANTHONY BITONTI



*Senior Program  
Coordinator*

TRICIA WILLIAMS



*Senior Program  
Coordinator*

SARAH M. BLANFORD



*Senior Program  
Coordinator*

CAITY SMITH



*Senior Program  
Coordinator*

NATALIA FOMINYKH



*Senior Program  
Coordinator*

BEATA BIALY



*Senior Program  
Coordinator*

JOHANNA KOOLEMANS-BEYENEN



*Senior Program  
Coordinator*

SARAH THORNE



*Senior Program  
Coordinator*

ASHLEY NDIR



*Senior Program  
Coordinator*

MARINA BARNETT



*Senior Program  
Coordinator*

SARA BURBACK



*Program Coordinator*

HEATHER GREENLEY



*Program Coordinator*

ELISE VOORHIS



*Program Coordinator*

TONI LEE



*Administrative Coordinator*

LINDA LEE



*Receptionist*

## USEA STAFF

USEA employs an experienced group of skilled professionals committed to supporting our organization's mission.







United States Energy Association



1300 Pennsylvania Avenue, NW  
Suite 550, Mailbox 142  
Washington, DC, 20004



t: (202) 312-1230  
f: (202) 682-1682



[reply@usea.org](mailto:reply@usea.org)



[www.usea.org](http://www.usea.org)



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