

37th USAEE/IAEE NORTH AMERICAN CONFERENCE

ENERGY TRANSITIONS IN THE 21ST CENTURY

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37TH USAEE/IAEE North American Conference

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Looking forward to seeing you, November 1-4, 2020

38th USAEE/IAEE NORTH AMERICAN CONFERENCE – AUSTIN, TX

38th USAEE/IAEE North American Conference

November 1-4, 2020

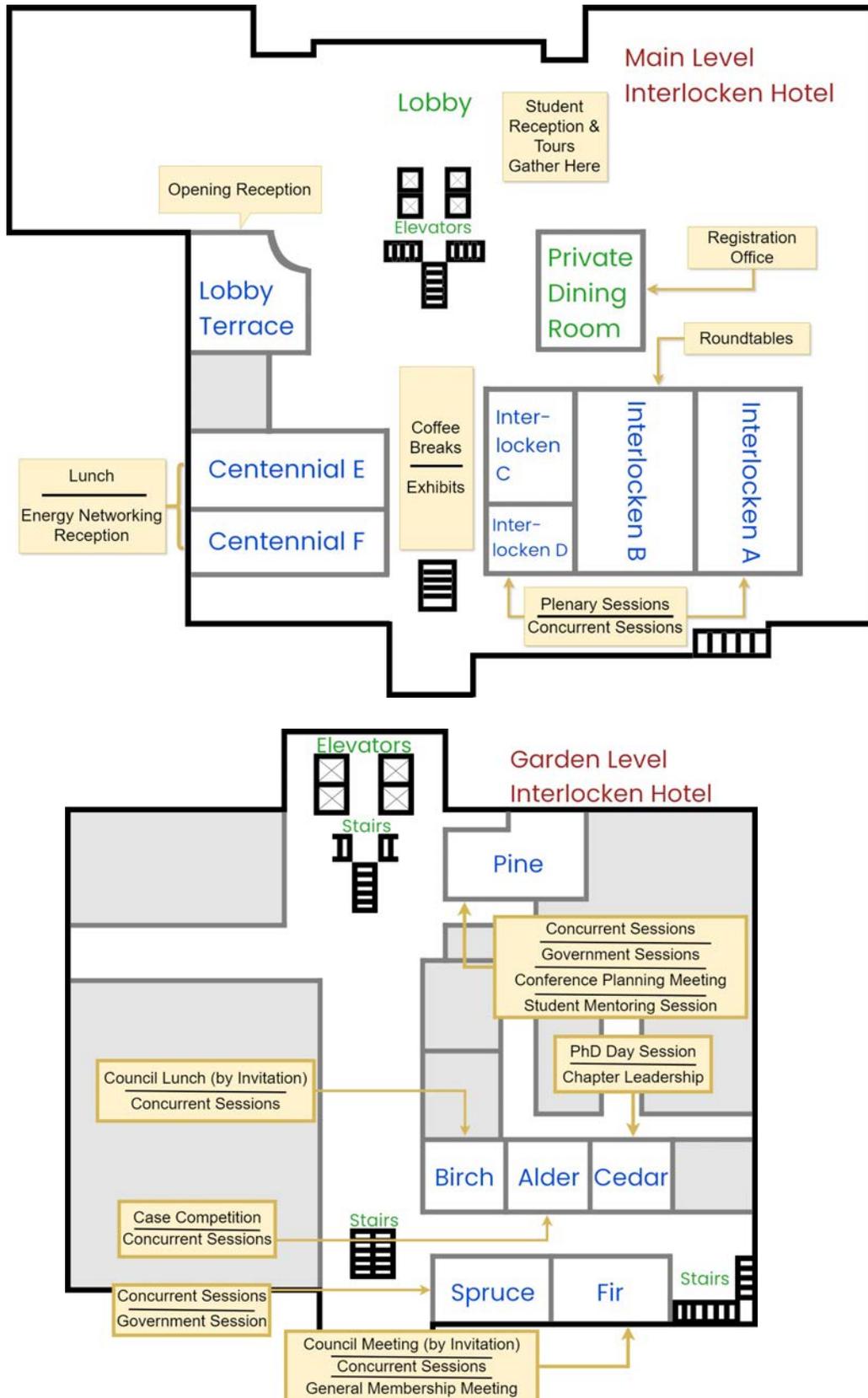
**Energy Economics: Bringing Markets, Policy and
Technology Together**

Sheraton Austin Hotel

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MEETING ROOMS AT THE OMNI INTERLOCKEN



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37TH USAEE/IAEE North American Conference

SUNDAY, NOVEMBER 3

REGISTRATION

8:00am – 7:00pm • Outside Private Dining Room

PHD DAY SESSION

10:30am – 4:00pm • Cedar Room

The PhD Day is a student-only event that will be held on Sunday, November 3 from 10:30am to 4:00pm. All current PhD Students in energy economics and related fields are invited to submit papers.

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CASE COMPETITION SESSION

2:00pm – 3:30pm • Alder Room

Erin Mayfield (Presiding)
Postdoctoral Research Associate,
Princeton University

Team #1 – BYuiuc

Boya Hou
Yangxue Yu
University of Illinois, Urbana-
Champaign

Team #2 – eVOLVe

Colin Sasthav
Dustin Gilmer
University of Tennessee

Competition Knowledge Partner:



STUDENT MENTORING SESSION

4:00pm – 5:30pm • Pine Room

Join us at this opportunity to meet a selection of mentors with experience in energy economics professions. Learn from seasoned professionals in various energy fields, chat about careers and personal experiences, and make connections with other conference attendees. All student and early professional attendees are welcome.

OPENING RECEPTION

6:00pm – 7:30pm • Lobby Court and Terrace

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37TH USAEE/IAEE North American Conference

MONDAY, NOVEMBER 4

REGISTRATION

7:00am – 7:00pm • Outside Private Dining Room

MORNING NETWORKING COFFEE

7:45am – 8:30am • Centennial Ballroom Foyer

WELCOME AND INTRODUCTION

8:30am – 8:45am • Interlocken BCD

KEYNOTE PRESENTATION

8:45am – 9:30am • Interlocken BCD

William "Bill" Ritter Jr (Keynote Speaker)
Former Governor of Colorado
"State of the States: Driving the Energy Transition for more than 250 Million Americans"

PLENARY SESSION: GEOPOLITICS OF ENERGY TRANSITION

9:30am – 11:00am • Interlocken BCD

The notion of an 'energy transition' remains an inchoate concept; its links to geopolitics and security are even less well-understood. Classically understood to encompass shifts in the national supply of energy or the discovery of new energy resources, energy transitions are now impacting markets, demand, and trade. Panelists will explore some of the contours, which range from institutional shifts in the influence and membership of multilateral organizations, to the accelerating growth of trade in natural gas, to issues of resilience and cybersecurity that are growing in importance with the rise of interconnected systems, to the changing landscape for conflict and other minerals due to these changes in technologies and their deployment in large numbers.

Morgan Bazilian (Presiding)
Director, Payne Institute of Public Policy, Colorado School of Mines

Wim Thomas
Chief Energy Advisor, Shell International BV

Amy Jaffe
Senior Fellow and Director, Council on Foreign Relations

Andreas C Goldthau
Franz Haniel Professor for Public Policy, Willy Brandt School of Public Policy, Research Group Lead, Institute for Advanced Sustainability Studies

Eirik Waerness
Senior Vice President and Chief Economist, Equinor ASA

COFFEE BREAK

11:00am – 11:30am • Centennial Ballroom Foyer

DUAL PLENARY SESSION: DECARBONISATION OF NORTH AMERICAN POWER

11:30am – 1:00pm • Interlocken BCD

The North American power market is rapidly evolving, and decarbonizing, due to the continued economic opportunities for natural gas, renewables, and increasingly storage, demand response and other modern power system solutions. This panel will explore the critical nature of technology innovation, policy and regulation, and business model evolutions, including regional and international related issues.

Douglas Arent (Presiding)
Deputy Associate Laboratory Director, NREL

Jesse Jenkins
Postdoctoral Environmental Fellow, Harvard Kennedy School and Harvard University Center for the Environment

Debra Lew
Founder, Debra Lew LLC
Steve Berberich
President and Chief Executive Officer, California ISO

DUAL PLENARY SESSION: CHALLENGES TO ENERGY INFRASTRUCTURE DEVELOPMENT IN U.S., CANADA AND MEXICO

11:30am – 1:00pm • Interlocken A

This panel will explore the challenges and potential solutions in building new energy infrastructure in the U.S., Canada and Mexico. While the three countries share similar experiences, they also have unique issues. Are their learnings about successful solutions that can be transferred between nations? To what extent does a lack of energy infrastructure limit energy flows across shared borders? How should those issues be resolved?

Paula A. Gant (Presiding)
SVP, Corporate Strategy and Innovation, Gas Technology Institute

Luis Serra Barragan
Executive Director, Tecnologico de Monterrey Energy Initiative at the School of Government and Public Transportation

Tisha Schuller
Principal, Adamantine Energy
Jean-Denis Charlebois
Chief Economist, Canadian Energy Regulator

AWARD LUNCHEON

1:00pm – 2:30pm • Centennial Ballroom

USAEE Adelman Frankel Award to:
BP Statistical Review of World Energy

USAEE Senior Fellow Awards:
Dr. Wallace E. Tyner (posthumous)
Dr. Andrew Kleit

Case Competition Awards
Best Working Paper Award

ROUNDTABLE AND CONCURRENT SESSIONS 1-9

2:30pm – 4:00pm

1. Roundtable: Women in Energy (Interlocken B Room)

Energy Price Forecasting Tricks of the Trade

Energy prices can be notoriously difficult to forecast, with projections often undermined by unexpected weather events, the daily whims of world leaders and gaps in fundamental supply and demand data. The advent of computer-assisted big data analytics and satellite imagery seems to offer a means of improvement for accuracy. In electricity markets where precision is most necessary, computer-assisted digital technologies are likely to have a large impact, but oil and gas price forecasting remains more of an art than a science as previous methodologies and algorithms need to be adjusted to reflect changing digitized energy and vehicle technologies and consumer use patterns. Four distinguished women forecasters from government, business and academia discuss changes in the tools and methods used to forecast energy prices; successes and challenges to accurate energy price forecasting; and the opportunities for women and diverse workforces in the energy forecasting field.

Amy Myers Jaffe, Presiding
Senior Fellow and Director, Council on Foreign Relations

Kathryn Downey Miller, President, BTU Analytics
Helen Currie, Chief Economist, ConocoPhillips
Jill N Scotcher, Energy Economist, Chevron

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MONDAY, NOVEMBER 4, CONTINUED

2. Energy Storage and the Grid 1

(Interlocken A Room)

Derek Olmstead, Presiding
Director Capacity Markets, Market Surveillance Administrator

Generators' Owned Energy Storage System Can Increase System Cost: Cause and Solution (8 min.)

Rui Shan, Oak Ridge National Laboratory
Mingquan Li, Duke University

Assessing the Role of Energy Storage as a Peaking Capacity Resource in the United States (8 min.)

Will Frazier, Wesley Cole, National Renewable Energy Laboratory

How Does Energy Storage Affect the Generation and Revenue of Existing Generation Technologies? (8 min.)

Naga Srujana Goteti, Eric Hittinger, Rochester Institute of Technology
Ines Azevedo, Brian Sergi, Carnegie Mellon University

Complementary Roles of Power-to-Gas-to-Power and Batteries in a 100% Reliable Wind and Solar Electricity System (15 min.)

Jacqueline A. Dowling, Nathan S. Lewis, California Institute of Technology
Ken Caldeira, Mengyao Yuan, Fan Tong, Carnegie Institution for Science

3. Energy & Economic Growth 1

(Pine Room)

Peter Balash, Presiding
Senior Economist, US Department of Energy - NETL

Gasoline Subsidy Reform and Economic Growth: A Comparative Analysis (8 min.)

Muhammad I Akimaya, King Fahd University of Petroleum and Minerals

Macroeconomic and Sectoral Impacts of Gas Supply Increases in Nigeria: A CGE Analysis (15 min.)

Emmanuel O Agiaye, Emerald Energy Institute, University of Port Harcourt
Adeola F Adenikinju, Centre for Energy Economics, Petroleum and Law, University of Ibadan

Case Study: Adoption and Penetration of Modern Energy Technology in Nigeria's Residential Sector (15 min.)

Adeola F Adenikinju, Dilinna L Nwobi, Nkechinyelu P Oranye, Centre for Petroleum Energy Economics and Law CPEEL University of Ibadan Nigeria
Olalekan J Akintande, Laboratory for Interdisciplinary Statistical Analysis, University of Ibadan Nigeria

Rainfall, Temperature, Energy and Economic Growth in Ethiopia: A Non-Linear and Asymmetric Approach (15 min.)

Nyakundi M Michieka, Richard S Gearhart, California State University, Bakersfield
Noha Razek, University of Regina

4. Longer-Term Energy

Transition 1 (Interlocken D Room)

Christophe Bonnery, Presiding
Director Economics & Prospective, F-AEE

Canada's Energy Transition: Trends and Indicators (15 min.)

Jean-Denis Charlebois, Abha Bhargava, Ryan Creighton, Margaret Skwara, Matthew Hansen, Canadian Energy Regulator

Case Study: Synergy Options Between Gas-fired Electricity Generation and Solar PV in the Power Sector Markets of Gulf Cooperation Council Countries (GCC) and the U. S. (15 min.)

Nabeel H Alabbas, SAUDI ARAMCO
Joseph Nyangon, University of Delaware

Do Market Barriers Exist for Renewables? A Portfolio Approach (15 min.)

Elizabeth A Wachs, Bernard Engel, Purdue University

The State-level Impacts of the Introduction of a Carbon Tax in the United States (15 min.)

Jon Stenning, Unnada Chewpreecha, Hector Pollitt, Cambridge Econometrics

5. Renewables in the Electricity System 1

(Interlocken C Room)
Edson Daniel Lopes Goncalves, Presiding
Professor, FGV - CERI

Improving Curtailment Representation in Utility Planning Tools (8 min.)

Brady Stoll, Elaine Hale, Jennie Jorgenson, Matt Irish, National Renewable Energy Laboratory

Impacts of High VRE Futures on Demand-side Decisions (15 min.)

Cody Warner, Jo Seel, Ben Paulos, Andrew D Mills, Lawrence Berkeley National Laboratory

Assessing Country and Sub-National Region Renewable Energy Potential (15 min.)

Gregory Upton, Siddhartha Narra, LSU Center for Energy Studies
Areendam Chanda, LSU Department of Economics

Property Tax Incentives and Wind Energy Development: Effectiveness and Fiscal Impacts (15 min.)

Ziqiao Chen, Yoon-Jung Choi, Syracuse University

6. Student Best Paper Award Competition

(Spruce Room)

Eric Hittinger, Presiding
Associate Professor, Rochester Institute of Technology

Do Federal Oil and Gas Assessments Affect Lease Acquisition Behavior? A Natural Experiment in the Williston Basin (15 min.)

Jesse D Backstrom, Texas A&M University

Credit and attention in the adoption of profitable energy efficient technologies in Kenya (15 min.)

Susanna Berkouwer, UC Berkeley
Joshua T Dean, Institute for Behavior & Inequality

Does Increasing Block Pricing Decrease Energy Use? Evidence from the Residential Electricity Market (15 min.)

Becka Brolinson, Georgetown University

Not on My Coast? North American Natural Gas Markets Under LNG Demand Growth and Infrastructure Restrictions (15 min.)

Baturay Calci, University of Texas

7. Environmental Issues with Shale Oil & Gas 1

(Fir Room)

Daniel Raimi, Presiding
Senior Research Associate, Resources for the Future

Patterns and Drivers of Flaring in the Permian Basin (15 min.)

Mark Agerton, UC Davis

An Estimate-based Approach to Pricing Methane Emissions (15 min.)

Levi Marks, University of California, Santa Barbara

Oil and Gas Well Targeting: Implications for Supply and Methane Emissions (15 min.)

Benjamin Gilbert, Colorado School of Mines
Gavin Roberts, Weber State University

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MONDAY, NOVEMBER 4, CONTINUED

8. Oil Supply 1 (Birch Room)

Lindsay Goldstein, Presiding
Program Analyst, ONRR

Effects of Tax Cuts and Jobs Act in the Upstream Oil and Gas Industry (8 min.)

Victor Del Carpio Neyra, Svetlana Ikonnikova, Bureau of Economic Geology, The University of Texas at Austin

The Marginal Barrel of Oil (15 min.)

Giacomo Benini, Stanford University
Valerio Dotti, Washington University in St. Louis

Case Study: Effect of Carbon Taxes Applied to Upstream Carbon Emissions on Reserves Estimates (15 min.)

Florent Rousset, Regional Director, Gaffney, Cline & Associates

OPEC's "Reasonable Oil Price Level" Notion and the External Breakeven in Saudi Arabia, Russia and Canada: Accounting for Economic Cycles and Pipeline Politics (15 min.)

Noha Razek, The University of Regina
Nyakundi M Michieka, California State University, Bakersfield
Emilson Silva, The University of Alberta

9. LNG (Alder Room)

Robert Borgstrom, Presiding
Advisor on Energy Regulation,
Independent Consultant

Liquefied Natural Gas as an Alternative to the Transportation Sector in Brazil (8 min.)

Drielli Peyerl, Dominique Mouette, Pedro Gerber Machado, University of São Paulo

Growing U.S. LNG Exports and the Impact of Removing Destination Clauses on Market Liquidity in the Asia-Pacific (8 min.)

Fang-Chia Lee, Researcher, Asia Pacific Energy Research Centre

Case Study: How the U.S. LNG Export Models May Compete on European and Asian Gas Markets in Increasing LNG Trade and Arbitrage (8 min.)

Aminam Talipova, Higher School of Economics, National Research University

Exploiting Real Options in LNG Trade (15 min.)

Peter R Hartley, Kenneth B Medlock III,
Rice University Baker Institute

Case Study: Small-scale LNG Potential in the Asia Pacific Region (15 min.)

Diego Rivera Rivota, Researcher, Asia Pacific Energy Research Centre (APEREC)

COFFEE BREAK

4:00pm - 4:30pm • Centennial Ballroom Foyer

ROUNDTABLE AND CONCURRENT SESSIONS 10-18

4:30pm - 6:00pm

10. Roundtable: The Promise of Carbon Capture, Storage and Utilization (Interlocken B Room)

The National Energy Technology Laboratory (NETL) is pleased to host a roundtable that intensively examines the promise of Carbon Capture, Storage and Utilization (CCUS). As chief steward of the Department of Energy's carbon management program, NETL fosters technology development across the entire CCUS chain as it seeks to lower the capital and operating costs of carbon dioxide separation at gas processing units, industrial sources, and power plants, safely deliver, inject, and monitor CO₂ into saline reservoirs, and employ CO₂-based enhanced oil recovery and associated CO₂ storage as a means to incentivize capture. NETL will convene leading experts active in all phases of DOE's program, highlighting program highlights and successes, and examining remaining challenges facing the integration of CCUS into both the nation's energy economy and the global energy ecosystem. Special attention to recent tax incentives will be paid as the DOE moves to deploy CCUS by 2025.

Andrea McNemar, Presiding
Acting Technology Manager, Carbon Storage Program, National Energy Technology Laboratory, U.S. DOE

Justin Ong, Program Director, ClearPath Foundation
Joseph Thom, Director, Renewable Energy & Environmental Finance, Wells Fargo

Lynn Helms, Director, North Dakota Department of Mineral Resources
Vello Kuuskraa, President, Advanced Resources International, Inc.

11. Renewables In The Electricity System 2 (Interlocken A Room)

Peter Schwarz, Presiding
Professor of Economics, UNC Charlotte

System Integration Cost of High Penetration of Interruptible Renewable Energy (15 min.)

Nisal Herath, Wallace E Tyner, Purdue University

Capacity Markets versus Energy-only Markets: A Comparison Under Wind Energy Penetration (15 min.)

Cody Hohl, Chiara Lo Prete, The Pennsylvania State University

Retail Electricity Rate Design, Distributed Energy Resources, and Emissions (15 min.)

Burcin Unel, Institute for Policy Integrity at NYU School of Law
Elisheba Spiller, Kristina Mohlin, Environmental Defense Fund
Karen Tapia-Ahumada, Massachusetts Institute of Technology Energy Initiative

Case Study: Enhancing Price Formation Process in Electricity Markets to Support Advancing High Renewable Energy Targets: A PJM Case Study (15 min.)

Ali Daraeepour, Eric Larson, Tom Kreutz, Princeton University

12. Energy & Economic Growth 2 (Pine Room)

Ramses Omar Cabrales, Presiding
Energy Industry Analyst, Federal Energy Regulatory Comm

Natural Gas and Energy Transition: Perspectives of Demand in the Sao Paulo State (8 min.)

Mariana O Barbosa, Drielli Peyerl, Universidade de São Paulo (USP)

Long-term Investment Planning for the Electricity Sector in Small Island Developing States: Case Study for Jamaica (15 min.)

Travis Atkinson, Douglas Gotham, Paul V Preckel, Purdue University

Integrated Top-Down and Bottom-Up Approaches: A CGE Energy Model for a Developing Country (15 min.)

Alma R Cortes Selva, Dominique van der Mensbrugghe, Purdue University

Is the Global Economy a Superorganism? (15 min.)

Carey King, University of Texas at Austin
Andrew Jarvis, Lancaster University

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MONDAY, NOVEMBER 4, CONTINUED

13. Longer-Term Energy

Transition 2 (Interlocken D Room)

Michael Pollitt, Presiding
Professor, Judge Business School

U.S. Electricity Infrastructure of the Future: Generation and Transmission Pathways Through 2050 (15 min.)

Gopika Jayadev, Erhan Kutanoglu, Benjamin D Leibowicz, The University of Texas at Austin

Case Study: Improving Local and Long Term Distribution Grid Management: A Prospective Approach (15 min.)

Jonas Meyer, Christophe Bonnery, Enedis

What Happens Today, Tomorrow, and the Future Matters: The Effects of Foresight in Modeling the Impacts of Energy Policy (15 min.)

Daniel Steinberg, Maxwell Brown, National Renewable Energy Laboratory (NREL)

14. Influences on EV Demand

(Interlocken C Room)

Ben Schlesinger, Presiding
President, Benjamin Schlesinger & Assoc LLC

Assessment of the Electric Vehicle Charging Station Incentive Program in the U.S. Electric Vehicle Market: The Case of Missouri (15 min.)

Nhu G Nguyen, Tyner Wallace, Purdue University

Timing is Everything: Optimal EV Charging to Maximize Welfare (15 min.)

Miguel A Castro, Researcher, Inter-American Development Bank

Future Costs of Electric Vehicles: Effects of Technological Progress and Consumer Heterogeneity (15 min.)

Ranjit R Desai, Eric Williams, Eric Hittinger, Rochester Institute of Technology

Impact of Electric Vehicle Use in Uber and Lyft (15 min.)

Alan Jenn, Assistant Professional Researcher, University of California, Davis

15. Competition & Oil & Gas Price Arbitrage 1 (Spruce Room)

Benjamin Gilbert, Presiding
Assistant Professor, Colorado School of Mines

Closer to One Great Pool? Evidence from Structural Breaks in Oil Price Differentials (15 min.)

Michael Plante, Grant Strickler, Federal Reserve Bank of Dallas

Time-Varying Jump Intensities and the Interconnectedness of the North American Crude Oil Complex (15 min.)

Neil A Wilmot, University of Minnesota Duluth

Spatial Competition and Retail Pricing in the Newly-Created Mexican Gasoline Market (15 min.)

Shaun D McRae, Enrique Seira, ITAM

16. Environmental Issues with Shale Oil & Gas 2 (Fir Room)

Matthew Butner, Presiding
Economic Fellow, NYU Institute of Policy Integrity

NUMBY or Not? The Influence of Geographic Proximity on Public Risk Perception and Attitudes of Shale Gas Development in China (15 min.)

Huimin Tan, Southwestern University of Finance and Economics

Fracking and Indoor Radon: Spurious Correlation or Cause for Concern? (15 min.)

Katie Jo Black, Kenyon College
Shawn J McCoy, University of Nevada - Las Vegas
Jeremy G Weber, University of Pittsburgh

The Equity State of an Energy System: Air Quality, Climate Change, and Labor Market Equity of the Shale Gas Boom in the Appalachian Basin (15 min.)

Erin N Mayfield, Jared Cohon, Robinson Allen, Ines Azevedo, Nicholas Muller, Carnegie Mellon University

17. Oil Supply 2 (Birch Room)

John Holding, Presiding
Independent Energy Analyst,

Changes in Institutional Design and Learning-by-doing: An Empirical Study of Offshore Exploration Drilling Efficiency in South East Asia (8 min.)

Mohammad Kemal, Aldy Amir, SKK Migas

Estimating Potential Costs of Adding New Anthropogenic CO₂ and Expanding Production of Natural CO₂ for EOR in the Permian Basin (15 min.)

Steven T. Anderson, Steven M. Cahan, U.S. Geological Survey

Low-Carbon Electrofuel Synthesis From Variable Renewable Electricity: An Optimization-Based Techno-Economic Analysis (15 min.)

Evan D Sherwin, Stanford University

No Fool's Choice: How Unconventional Shale Development Fit into a Sustainable Energy Future for Emerging Economies (15 min.)

Ning Lin, Chief Economist, University of Texas, Austin

In the Name of Profit: Explaining the Emergence of the Global Oil Commodity Regime (15 min.)

Andreas Goldthau, Willy Brandt School of Public Policy
Llewelyn Hughes, ANU Crawford School of Public Policy

18. Student WIP Session (Alder Room)

This session aims to give students feedback from leading professors and the USAEE community who will be in attendance. Half an hour will be given for the presentation and discussion of each paper. All are welcome to attend and participate in the discussions.

Peter Hartley, Presiding
Peterkin Professor of Economics, Rice university

A Financial Analysis of the Importation of Liquefied Natural Gas from the United States as a Natural Gas Source to the Brazilian Market (15 min.)

Lauron Arend, Drielli Peyerl, Edmilson M dos Santos, University of São Paulo

Returns From Distributed Generation: Utilities, Consumers, and Communities (15 min.)

Arijit Sen, Nathan Hultman, University of Maryland, College Park

Transition Strategies to Harness Local Solar and Geothermal Energies in the USA: A Linear Programming Approach (15 min.)

Amos Oppong, Ma Jie, Kingsley Nketia Acheampong, Bismark Ameyaw, University of Electronic Science and Technology of China [UESTC]

37TH USAEE/IAEE North American Conference

MON., NOV. 4, CONT

NOTES:

YOUR TIME TO ENGAGE – ENERGY NETWORKING RECEPTION

6:30pm – 8:00pm • Centennial
Ballroom

Dennis J. O'Brien USAEE/IAEE Best
Student Paper Awards

This event is a networking reception with beverages and hors d'oeuvres where participants get to discuss energy-related topics of interest. There will be 8 tables with leaders on various energy topics and four 15-minute intervals will be allocated allowing participants to switch topics 4 times during the reception. Participants can also choose to remain at one table if the topic is of particular interest. This is a good way to get to know people with similar interests.

STUDENT RECEPTION

8:00pm – 10:00pm • Gordon Biersch
Brewery

Immediately following the Energy Networking Reception, come join fellow students at Gordon Biersch Brewery, a 5 minute drive from the conference hotel. Enjoy food and dessert in our reserved space, with drinks available for purchase. Transportation to/from the hotel will be provided.

Gordon Biersch Brewery, 1 West
Flatiron Crossing Dr. #428, Broomfield
CO

Reception sponsored by:

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Rice University's Baker Institute for Public Policy

CONFERENCE SURVEY: GIVE US YOUR FEEDBACK



We value your participation in our conference survey as this helps us to improve our programming to benefit all that attend.

Let us know what was of value to you!

<https://www.surveymonkey.com/r/USAEE2019>

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37TH USAEE/IAEE North American Conference

TUESDAY, NOVEMBER 5

REGISTRATION

7:00am - 7:00pm • Outside Private Dining Room

MORNING NETWORKING COFFEE

7:45am - 8:30am • Centennial Ballroom Foyer

DUAL PLENARY SESSION: GOVERNMENT POLICIES PROMOTING LOW CARBON TRANSITION

8:30am - 10:00am • Interlocken BCD

The U.S. has cut carbon emissions around 13% from 2005 to 2017 led by the electricity sector. Market forces contributing to the cut include lower natural gas prices, cost reductions in wind and solar, and energy efficiency investments in buildings, power plants, vehicles, and industry. A myriad of government policies have also contributed including federal R&D investment and tax incentives, stricter energy standards, and state and regional carbon cap-and-trade programs. Since these emissions cuts, though welcome, do not meet the even-deeper cuts recommended by the scientific community to safe guard our climate, this session explores a number of questions: What is ahead on the state and federal policy agenda? What policies will support efficient and effective pathways to lower-carbon energy economies given the myriad policy makers at various levels of government? What policies have a chance of being adopted, and why? How does the Green New Deal fit into this discussion?

Susan Tierney (Presiding)
Senior Advisor, Analysis Group

Kelly Sims-Gallagher
Professor of Energy and Environmental Policy and Director of the Center for International Environment and Resource Policy at The Fletcher School, Tufts

Sarah Ladislaw
Senior Vice President; Director and Senior Fellow, Energy and National Security Program, CSIS

Carrie Jenks
Executive Vice President, M.J. Bradley & Associates

DUAL PLENARY SESSION: U.S. ENERGY TRADE

8:30am - 10:00am • Interlocken A

This session will discuss North American energy trade in a global context. Globalization and international trade are pivotal to the energy complex, especially for coal, oil and refined products and increasingly for natural gas. By contrast, renewables and electricity generated from them are local and largely non-

tradeable energy sources. These energy sources are competing to enhance domestic and export-related infrastructure, with energy and environmental policies at all levels of government playing increasing role.

R Dean Foreman (Presiding)
Chief Economist, American Petroleum Institute

Kevin Book
Managing Director, ClearView Energy Partners

Horace Hobbs
Chief Economist, Phillips 66
Oliver Tuckerman
Vice President of Corporate Development and Strategy, Cheniere

COFFEE BREAK

10:00am - 10:30am • Centennial Ballroom Foyer

CONCURRENT SESSIONS AND GOVERNMENT TRACK 19-26

10:30am - 12:00n

19. Renewables In The Electricity System 3 (Interlocken B Room)

H. Alan Love, Presiding
Professor, Washington State University

**An Integrated Framework for
Analyzing Clean Energy Technology
Subsidies Applied to Residential Solar**
(15 min.)

Tiruwork B Tibebe, Eric Hittinger, Qing Miao, Eric Williams, Rochester Institute of Technology

**A Support Mechanism Through the
Shapley Value for Household
Photovoltaic Generation after Feed-in
Tariffs** (15 min.)

Yoshihiro Yamamoto, Takasaki City University of Economics

**The Effect of Rate Design on
Deployment of Distributed Energy
Resources** (15 min.)

Elisheba Spiller, Kristina Mohlin, Environmental Defense Fund
Burcin Unel, Institute for Policy Integrity at New York University School of Law
Karen Tapia-Ahumada, Massachusetts Institute of Technology Energy Initiative

**Electricity Market Design in a Zero
Marginal Cost Setting** (15 min.)

Robert Idel, Baker Institute for Public Policy at Rice University

20. Energy Storage and the Grid 2 (Interlocken A Room)

Eric Williams, Presiding
Associate Professor, Rochester Institute of Technology

**The Value and Interplay Between Gas
Generation and Energy Storage for
Power Systems with High Penetration of
Variable Renewables** (8 min.)

Nestor A Sepulveda, Dharik Mallapragada, MIT Energy Initiative

**Influence of Electric Vehicle Uptake on
Competitive Dynamics of Storage
Technologies in Electricity Sector
Applications** (15 min.)

Martin Beuse, Tobias S Schmidt, Bjarne Steffen, ETH Zurich

**Heat Pumps with Thermal Energy
Storage: The Cost, Peak Demand, and
Emissions Impacts of a Flexible,
Electrified Heating Sector** (15 min.)

Thomas Deetjen, Parth Vaishnav, Carnegie Mellon University

21. Government Session: Funding and Collaboration Opportunities for Energy Researchers (Pine Room)

The goal of the session is to strengthen contacts between energy researchers and representatives of different governmental agencies that fund research in energy economics, demystifying the funding application process and helping lower barriers between government and academia. The panelists will discuss different ways an energy economist can engage with governmental agencies, ranging from obtaining funding to connecting to other researchers and spinning off a startup. The session will include an interactive component, allowing the audience members to pitch their research ideas and receive feedback from the panelists.

Anna Ebers, Presiding
Statistician, Tetra Tech

Ellen Morris
Program Lead
University Partnerships, National Renewable Energy Laboratory

John Primo
Senior Social Scientist
Bureau of Ocean Energy Management, Department of Interior

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TUESDAY, NOVEMBER 5, CONTINUED

Elaine Ulrich

Senior Advisor
Solar Energy Technologies Office, U.S.
Department of Energy

Max Tuttmann

Technology-to-Market Adviser, ARPA-E,
U.S. Department of Energy

Jeffery Adkins

Senior Economist, National Oceanic
and Atmospheric Administration

22. Longer-Term Energy Transition 3

(Interlocken D Room)

Carey King, Presiding
Asst Director, Energy Institute,
University of Texas at Austin

Why Rapid and Deep Decarbonization Isn't Simple: Linking Bottom-up Socio-technical Decision-making Insights with Top-down Macroeconomic Analyses

(15 min.)

Turner Cotterman, Carnegie Mellon
University

How External Factors Influence Policy Goals Using the Example of Renewable Energy Standards

(15 min.)

Kristen E Brown, US Environmental
Protection Agency

Forecasting and Proposing Mitigation Pathway for USA CO2 Emissions From Fossil Fuel Combustion

(15 min.)

Bismark Ameyaw, Yao Li, University of
Electronic Science and Technology of
China

An Integrative Approach to CO2 Abatement Cost Curves: Accounting For Heterogeneity and Technology Interactions

(15 min.)

Saptarshi Das, Ranjit R. Desai, Eric Hittinger, Eric Williams, Rochester
Institute of Technology

23. Energy Access

(Interlocken C Room)

Noha Razek, Presiding
Assistant Professor, Economics
Department, University of Regina

Assessing Africa's Off-Grid Electricity Market

(15 min.)

F. Andrew Dowdy, Engineers Without
Borders USA

A Microeconomic Analysis of Household Energy Consumption: Evidence from Ghana Household Survey and Sustainability Implications

(15 min.)

Smart Edward SEA Amanfo, Sophia
University

Utility Bills and Household Financial Distress

(15 min.)

Reid Dorsey-Palmateer, Western
Washington University

City-level Efforts to Facilitate a Just Transition: A Survey Analysis

(15 min.)

Sanya Carley, David Konisky, Laura Helmke-Long, Indiana University

24. Competition & Oil & Gas Price Arbitrage 2

(Spruce Room)

Andrew Slaughter, Presiding
Executive Director, Deloitte Services LP

Isolating the Impacts of the Shale Revolution on the U.S. Energy Mix: Evidence from the Natural Gas Pipeline Network

(15 min.)

Matthew Butner, Institute for Policy
Integrity, NYU
Jonathan Scott, Energy Institute at
Haas, University of California Berkeley

Market Power in Australia's Eastern Natural Gas Market

(15 min.)

Kelly Neill, Rice University

Rotary Rig Parity: The Drilling Rate Augmented Relationship Between Oil and Gas Prices

(15 min.)

Gavin E Roberts, Weber State
University
Benjamin Gilbert, Colorado School of
Mines

25. US Electricity & Climate Policy

(Birch Room)

Nabeel Alabbas, Presiding
Energy Advisor, Aramco

Short Run Effects of Carbon Policy on U.S. Electricity Markets

(15 min.)

Steve Dahlke, Colorado School of
Mines

U.S. Power Sector Transitions Under High Electrified Futures

(15 min.)

Matteo Muratori, Trieu Mai, Caitlin Murphy, NREL

Capacity Expansion of SERC's Generator Fleet Under Climate Change

(15 min.)

Francisco Ralston Fonseca, Paulina Jaramillo, Haibo Zhai, Aviva Loew, Mario Bergés, Edson Severnini,
Carnegie Mellon University
Michael Craig, University of Michigan
Yifan Cheng, Bart Nijssen, University of
Washington

Emission Reduction Policy Interactions in the United States

(15 min.)

Neha S Patankar, Harrison Fell, Joseph Decarolis, North Carolina State
University

26. Petroleum Fiscal Regimes

(Alder Room)

Graham Davis, Presiding
Professor Emeritus, Colorado School of
Mines

The Relative Inefficiency of Petroleum Fiscal Regimes in Latin America and the Caribbean

(15 min.)

Graham A Davis, Colorado School of
Mines
James Smith, Southern Methodist
University

Scoring Auctions, Investment and Production Outcomes: The Case of Oil and Gas Leases in Mexico

(15 min.)

Igor Hernandez, Rice University

Analysis on the Implementation of Gross Split Production Sharing Contract: Simulation on the Oil and Gas' Project Economics in Indonesia

(15 min.)

Dian P. Mashari, Made Sumandra, SKK
Migas (Special Task Force for
Upstream Oil And Gas Business
Activities Republic of Indonesia)

The Intensive and Extensive Effects of Tax Holidays

(15 min.)

Timothy Fitzgerald, Texas Tech
University

KEYNOTE LUNCHEON

12:00n - 2:00pm • Centennial Ballroom

Consul General Stephane Lessard

(Keynote Speaker)

Consul General, Consulate General of
Canada
"Canada and the United States:
Partners for North American Energy
Security"

DUAL PLENARY SESSION: PATHS TO A SUSTAINABLE FUTURE

2:00pm - 3:30pm • Interlocken BCD

The majority of decision makers now seem to believe we should reduce atmospheric concentrations of CO2 with a move to renewables and storage. However, the best paths from a 40,000 Calorie daily per capita fossil fuel diet is rather controversial. We focus on three possibilities - nuclear, a continuing dash to gas, and carbon capture and sequestration (CCS). We have the technology for each of these

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solutions, but each has its benefits and costs. For example, nuclear has little carbon emissions but there are visions of mushroom clouds and toxic wastes dancing in many heads. Gas is abundant but it too emits carbon from burning and fugitive emissions. Nuclear has little carbon emissions but there are visions of mushroom clouds and toxic wastes dancing in many heads. With CCS, where can we economically put all the carbon we capture. For these and some other less mainstream solutions (dilithium crystals, anyone?), we will consider their potential, costs, and drawbacks along with the needed technology breakthroughs and carbon policies to incentivize their application.

Carol Dahl (Presiding)
Senior Fellow, Payne Institute of Public Policy, Colorado School of Mines

Sara Banaszak
Senior Advisor, Exxon Mobil Corporation

Shannon Bragg-Sitton
Manager of the Systems Integration Department in the Nuclear Systems Design & Analysis Division, Idaho National Laboratory

Cindy A. Yeilding
Senior Vice President, BP America Inc.

DUAL PLENARY SESSION: CHANGING OIL AND GAS COMPANY INVESTMENT

2:00pm - 3:30pm • Interlocken A

This panel will explore how oil and gas company investment has changed and the impact on oil and gas supply. Changing expectations for prices, technological progress (including the sustainability of US tight oil), policy, and geopolitics have impacted company thinking re: oil/gas investment, both in absolute terms and relative to renewables. How have these factors changed company investment plans, and what will the implications be for future supply? Are prospects different for oil vs gas?

Mark Finley (Presiding)
Fellow in Energy and Global Oil, Rice University

Mark S Berg
Executive Vice President, Pioneer Natural Resources

Chris Birdsall
Manager Economics & Energy, Corporate Strategic Planning, Exxon Mobil Corporation

Per Magnus Nysveen
Senior Partner, Rystad Energy

COFFEE BREAK

3:30pm - 4:00pm • Centennial Ballroom Foyer

CONCURRENT SESSIONS AND GOVERNMENT TRACK 27-34

4:00pm - 5:30pm

27. Renewables In The Electricity System 4

(Interlocken B Room)

Lucy Qiu, Presiding
Assistant Professor, University of Maryland College Park

Case Study: Simulation of Solar Panel Adoption Using Agent-based Model a Case Study of California (15 min.)

Zining Yang, Yuan Yuan Lee,
Claremont Graduate University

Solar Pricing: Gross Metering and Other Alternatives to Net Metering (15 min.)

**Peter M Schwarz, Nathan Duma,
Ercument Camadan**, UNC Charlotte

Output-based Incentives for Residential Solar PV: Demand Responsiveness, Cost-effectiveness, and Alternative Policy Scenarios (15 min.)

Marta Talevi, London School of
Economics and Political Science

28. Energy Storage and the Grid 3 (Interlocken A Room)

Kyle Haemig, Presiding
Economist, Central Municipal Power

Assessing the Economics of Commercial/Residential Storage Using an Intertemporal Decision Framework (15 min.)

**Himanshu Deshpande, Jay Whitacre,
Guannan He**, Carnegie Mellon
University

The Effects of Electricity Consumption and Rate Design on Solar Plus Storage-enabled Grid Defection (15 min.)

**Will Gorman, Duncan Callaway,
Stephen Jarvis**, University of California,
Berkeley

Socially Optimal Operation of Grid- Scale Energy Storage: Balancing Direct Benefits with Indirect Costs (15 min.)

**Eric Hittinger, Maanasa
Govindarajula, Rodrigo Folgar**,
Rochester Institute of Technology

29. Government Session: Energy Data for Western and Federal Lands (Pine Room)

The U.S. does not have a single central repository for all energy-related information. The U.S. Energy Information Administration provides a wide range of valuable data; individual bureaus/offices at Department of the Interior provide information on energy and revenue from Federal lands; the Federal Energy Regulatory Commission provides information on regulated activities such as oil and gas pipelines; individual states have planning and regulatory bodies that publish data on energy subject to their jurisdiction/taxation; and some energy companies publish energy statistics and forecasts. The speakers will provide demonstrations of how to use some of the tools on their agencies' websites and provide information the other data they make available to the public. After the presentations, there will be time not only for questions but also for discussion of additional data resources and tools that attendees wish were available. Speakers will be available after the session to continue discussions and provide hands-on access to their websites.

Kim Coffman, Presiding
Economist, Bureau of Ocean Energy
Management

Chris Peterson

Senior Energy Markets Analyst, U.S.
Energy Information Administration

Lindsay Goldstein

Program Analyst, Office of Natural
Resources Revenue, U.S. Department of
the Interior

Maroya Faied

Program Analyst, Office of Natural
Resources Revenue, U.S. Department of
the Interior

Brian N. Shaffer

Geologist Supervisor/Project Chief, U.S.
Geological Survey

30. Electricity Market Management (Interlocken D Room)

Sanya Carley, Presiding
Professor, Indiana University

Policy Options to Reduce the Risk of Resource Constraints Under the Increase Demand of New Energy Technologies (8 min.)

Hisanori Nei, Professor, National
Graduate Institute for Policy Studies

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Using a Bottom-up Energy Systems Model to Analyze Role of Electrification in the End-use Sectors in the Urban Areas (15 min.)
P. Ozge Kaplan, Mine Isik, U.S. EPA

A Machine Learning Approach to Demand Response Supply Estimation (15 min.)
Olvar Bergland, NMBU
Alan Love, WSU

Improving the Provision of Electricity Network Services Through Machine Learning – The Case of Light Disco in Brazil (15 min.)
Rafael M Souza, Joisa Dutra, Camila Lobo, Pedro Medeiros, FGV CERI

The Value of Intra-day Coordination of Electric Power and Natural Gas System Operations (15 min.)
Michael Craig, Carlo Brancucci, Omar Guerra, Bri-Mathias Hodge, U.S. National Renewable Energy Laboratory
Kwabena A Pambour, cleaNRGI Solutions GmbH

31. Competitiveness of Coal

(Interlocken C Room)

Tim Coburn, Presiding
Professor of Energy & Operations Management, University of Tulsa

The Impact of a Carbon Tax on Substitution of Natural Gas for Coal (15 min.)
Kelly A Stevens, Deborah A. Carroll, University of Central Florida

How Fuel Accounting Paradigms Influence Coal Power Plant Profitability (15 min.)
Joseph M Daniel, Sr. Energy Analyst, Union of Concerned Scientists

Coal Plants with Carbon Capture and Utilization – Potential Business Scenarios with 45Q Tax Credits and Enhanced Oil Recovery (15 min.)
Joel R. Theis, Peter C. Balash, Jeffrey W. Hoffmann, National Energy Technology Laboratory
Arun K.S. Iyengar, Iivonne A. Pena-Cabra, Key Logic Systems, Inc.

Modeling Measures to Improve Efficiency of Electricity Markets (15 min.)
Donald A Hanson, David Schmalzer, Argonne National Laboratory
Chris Nichols, Peter Balash, NETL

32. Energy Demand Analysis

(Spruce Room)

Benjamin Leibowicz, Presiding
Assistant Professor, University of Texas at Austin

The Time-of-day Travel Demand Elasticity Paradox (15 min.)
Cody Nehiba, Louisiana State University

Climatic Impact on China's Residential Electricity Consumption: Does the Level of Income Matter? (15 min.)
Ying Yu, Xiamen University
Kerui Du, China Institute for Studies in Energy Policy, Xiamen University
Chu Wei, Department of Energy Economics, School of Economics, Renmin University of China

Alternatives to the Autoregressive Moving Average Structure in State Adjustment Dynamic Demand Modeling (15 min.)
Steven C Fischer, Inter-American Development Bank (retired)

Revisiting Income and Price Elasticities for Residential and Industrial Electricity and Road Gasoline and Diesel (15 min.)
Brant Liddle, Senior Research Fellow, Energy Studies Institute, NUS

Trends in U.S. Manufacturing Energy Consumption (15 min.)
Behjat Hojjati, U.S. Energy Information Administration

33. Energy & The Environment

(Birch Room)

Robert Kleinberg, Presiding
Senior Research Scholar, Center on Global Energy Policy

Traffic Congestion and Air Quality in Beijing: Utilizing Taxi Trajectory Data (15 min.)
Zhen Lei, Penn State University
Fan Xia, Jintao Xu, Ximeng Chen, Yu Liu, Peking University

Pollution Externalities, Generation Subsidies and Efficiency in Energy and Capacity Markets (15 min.)
Sylwia Bialek, Burcin Unel, Institute for Policy Integrity, New York University

Internalizing Damages from CO2 and Air Pollution: Should We Co-regulate Greenhouse Gas and Air Pollution Emissions Via Taxation? (15 min.)
Michael B Roth, Peter Adams, Paulina Jaramillo, Nicholas Muller, Carnegie Mellon University

Case Study: Sinking Groundwater Cost of Energy at Saudi Arabia (15 min.)
Ridha H Abbas, Engineer, Saudi Aramco

34. Energy & Financial Markets

(Alder Room)

Michael Plante, Presiding
Senior Research Economist, Federal Reserve Bank of Dallas

The Impact of Virtual Spread Product on the Multi-settlement Electricity Market Price (8 min.)
Hyungkwan Kim, Lawrence Berkeley National Laboratory

Determinants of Forward Premium in the Electricity Market (15 min.)
Kun Li, Beijing Normal University

China's Crude Oil Futures Contract: It's Characteristics, Trading History, and Potential for Success (15 min.)
Ronald D Ripple, R.D. Ripple & Associates
David Broadstock, Hong Kong Polytechnic University
Case Study: Financing Renewable Energy in Brazil – The Case of Wind Power Plants (15 min.)
Edson Daniel Lopes Goncalves, Professor, FGV – CERI

USAEE GENERAL MEMBERSHIP MEETING

5:30pm – 6:00pm • Fir Room

AN EVENING AT CSM'S GEOLOGY MUSEUM

6:30pm – 9:30pm • Colorado School of Mines Geology Museum
(Board bus at 5:45 pm)

Join us for an evening of conviviality (tango lessons optional) at The Colorado School of Mines Geology Museum. The museum is home to one of the state's two Goodwill moon rocks collected during the Apollo 17 mission. It was started in 1874 and displays mineral, fossil, gemstone, meteorite and historic mining artifact exhibits on two floors. The museum serves as the state repository for Colorado's mineral heritage and promotes its importance and understanding to the university community and the public. It aims to inspire scientific curiosity through education and research while encouraging appreciation of the earth and responsibility for its mineral, fossil, meteorite, and historic mining treasures.

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WEDNESDAY, NOVEMBER 6

REGISTRATION

7:00am – 2:00pm • Outside Private Dining Room

2020 CONFERENCE INFORMATION MEETING (BY INVITATION)

7:30am – 8:30am • Pine Room

MORNING NETWORKING COFFEE

7:45am – 8:30am • Centennial Ballroom Foyer

CONCURRENT SESSIONS AND GOVERNMENT TRACK 35–42

8:30am – 10:00am

35. Regulation (Interlocken B Room)

Marie Fagan, Presiding
Lead Economist, London Economics Intl LLC

Design of Regulation (15 min.)
Robert L Kleinberg, Senior Research Scholar, Boston University; Columbia University

Managing the Threat of Regulatory Capture Under the European Energy Union (15 min.)
Rafael Emmanuel Macatangay,
Volker Roeben, University of Dundee

Comparing the Results of Renewable Energy Auctions: A Model-Based Analysis of Recent Trends from Around the World (15 min.)
Michael G Pollitt, University of Cambridge
Simon F Lang, London School of Economics

How Much Would China Gain from Power Sector Reforms? (15 min.)
Govinda R Timilsina, World Bank Group
Xi Yang, China University of Petroleum Beijing, China
Jun Pang, Renmin University, China

36. Energy Use By Buildings (Interlocken A Room)

Greg Adams, Presiding
Team Leader Coal & Uranium Analyst, Energy Information Administration

Canada's Built Environment in the Energy Transition (15 min.)
Matthew Hansen, **Michael Nadew**, National Energy Board

Carbon Net-Neutral Residential Case Study – Can State-Of-The-Art Renewable Energy Technology Deliver Economically? (15 min.)
Ben Schlesinger, Benjamin Schlesinger and Associates, LLC

Heat Pumps' Impact on Housing Prices and Implications for Policy Instruments to Facilitate Electrification and Deep Decarbonization (15 min.)
Xingchi Shen, **Anand Patwardhan**, **Yueming Qiu**, University of Maryland College Park
Parth Vaishnav, Carnegie Mellon University
Pengfei Liu, University of Rhode Island

Analyzing Multifamily Building Common Area Electricity Consumption Features and Saving Potentials – Findings From Residential Building Energy Audit Project (15 min.)
Ting-Jui Sun, **Meng-Tai Fu**, **Wen-Hua Liao**, **Min-Chia Su**, **Chuan-Yi Su**, Industrial Technology Research Institute, Taiwan
Wen-hsiang Lin, **Wei-Huang Hsieh**, Taiwan Green Productivity Foundation

37. International Trade, Finance & Energy (Fir Room)

Guy Caruso, Presiding
Senior Advisor, CSIS

Spatial Effects of Foreign Direct Investment on Carbon Emissions: Evidence from China's Provincial Panel Data (8 min.)
Xingyu Wang, University of East Anglia
Zhifu Mi, University College London
Hang Lin, **Junjie Hong**, University of International Business and Economics

The Role of Oil Price Changes on the Balance of Trade: Evidence From Korea-ASEAN Commodity Trade Data (15 min.)
Jung-ho Baek, University of Alaska Fairbanks
Yoon Jung Choi, Sejong Institute

California's Carbon Policy and Emission Leakage: A Machine Learning Approach (15 min.)
Chiara Lo Prete, The Pennsylvania State University
Ashish Tyagi, Frankfurt School of Finance & Management

Technical Potential of Biomass Energy in the APEC Region (15 min.)
Dan L Nguyen, Asia Pacific Energy Research Centre (APEREC)
Michael O Sinocruz, DOE of the Philippines

38. Electricity Supply Disruption (Interlocken D Room)

Karl Nalepa, Presiding
President, ReSolved Energy Consulting

Resource Adequacy and Scarcity Pricing Implications of Correlated Generator Failures (8 min.)
Luke A Lavin, **Jay Apt**, **Sinnott Murphy**, Carnegie Mellon University

The Wider Economic Benefits of Managing Power Grids Through Vegetation Management: Evidences From the U.S. (8 min.)
Marcello Graziano, **Brian Becker**, **Adam Gallaher**, Central Michigan University
Fred V. Carstensen, **Peter Gunther**, Connecticut Center for Economic Analysis, University of Connecticut

Quantifying Generator Outages and Non-Performance in the Midcontinent Independent System Operator (15 min.)
Chen-Hao Tsai, **Stephen Rose**, Midcontinent Independent System Operator

Accounting for Uncertainty and Risk Aversion in Grid Expansion Models (15 min.)
Eric Williams, **Eric Hittinger**, **Naga Srujana Goteti**, Rochester Institute of Technology

39. Changing Transport Sector Impacts (Interlocken C Room)

Ning Lin, Presiding
Chief Economist, CEE, Univ. of Texas at Austin

Effects of On-Demand Ridesourcing on Vehicle Ownership, Travel, Energy, and Environmental Outcomes in the United States (15 min.)
Jacob W Ward, **Jeremy J Michalek**, **Inês L Azevedo**, **Constantine Samaras**, Carnegie Mellon University

Private and Social Benefits and Costs of Long-Haul Truck Electrification in the United States (15 min.)
Fan Tong, **Corinne Scown**, Lawrence Berkeley National Laboratory
Maximilian Auffhammer, **Derek Wolfson**, University of California, Berkeley

The Dynamic Costs & Benefits of Technology-Forcing Policy Nested in a Broader Performance Standard: The Case of ZEV & CAFE (15 min.)
Arthur HC Yip, **Kate S Whitefoot**, **Jeremy J Michalek**, Carnegie Mellon University

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The Impact of Rapid Technological Change in the Global Energy Industry AND on U.S. Imports Containing Rare Earth Elements (15 min.)
Cecilia M Logan, Clinton Noack, Isabela Madinabeitia, Deloitte Consulting LLP
Gavin Pickenpugh, William M Summers, NETL/DOE

40. Government Session: Laboratory Showcase

(Spruce Room)

The western United States provides natural resources necessary for energy conversion. The National Laboratory system is a primary conduit through which the Department of Energy promotes science and technology development along the energy value chain. Come listen to senior representatives discuss exciting nearer-term energy R&D across the nuclear, fossil, and renewable energy sectors.

Christopher Nichols, Presiding
National Energy Technology Laboratory

Shannon Bragg-Sitton
Idaho National Laboratory
Doug Arent
National Renewable Energy Laboratory
Peter Kobos
Sandia National Laboratory

41. Electricity & Climate Policy 2

(Birch Room)

Anna Ebers, Presiding
Statistician, Tetra Tech

Burning the Bridge Fuel: Regulation and Natural Gas Retirements (8 min.)
Cameron Duff, University of Colorado, Boulder

Aligning Climate and Health Benefits in Power Plant Siting and Retirement Decisions

(15 min.)
Brian Sergi, Allen Robinson, Nick Z Muller, Peter Adams, Inês Azevedo, Carnegie Mellon University
Steven J Davis, UC Irvine
Julian Marshall, University of Washington

Scenarios for Decarbonization of the Future Indian Electricity Sector

(15 min.)
Ivan Rudnick, Pablo Duenas, Audun Botterud, Carlos Batlle, MIT Energy Initiative
Karthik Ganesan, Council on Energy, Environment and Water
Dimitri J Papageorgiou, Bryan K Mignone, Michael R Harper, Srinivasan Rajagopalan, ExxonMobil Research and Engineering Company

True or Not True: Carbon-free Electricity Generation is Possible

(15 min.)
Rolf Golombek, Simen Gaure, Frisch Centre

42. Technology Innovation

(Alder Room)

Hisanori Nei, Presiding
Professor, GRIPS

Effectiveness of Expert Judgement in Technology Innovation

(15 min.)
Rebecca E Ciez, Elke Weber, Princeton University
Daniel Steingart, Columbia University

Evolution of Hardware Costs and Soft Costs in Photovoltaic Systems

(15 min.)
Magdalena Klemun, Massachusetts Institute of Technology
James Mc Nerney, Harvard University
Jessika E. Trancik, Goksin Kavlak, MIT

An Assessment of Utility-Scale Solar Farm Locations

(15 min.)
Gilbert L Michaud, Christelle Khalaf, Ohio University

COFFEE BREAK

10:00am - 10:30am • Centennial Ballroom Foyer

DUAL PLENARY SESSION: GLOBAL DECARBONIZATION OF ROAD TRANSPORT

10:30am - 12:00n • Interlocken BCD

As the global power sector decarbonizes, the transport sector will become the main driver of CO₂ emissions growth. Much of the focus today is on the electrification of road transport since fuel substitution is considered to be less challenging than for other transportation modes. This session addresses the challenges and prospects of electrifying passenger cars and trucks around the world, including the infrastructure needs of the transition. What are the advantages and disadvantages of electrification vs. other decarbonization alternatives (e.g., hydrogen, biofuels)? Which countries or regions will be leaders in electrifying road transport, and which countries will lag? The panel also assesses the impact of automation and shared mobility on energy demand. Will they increase the efficiency of travel, thereby reducing energy demand. Alternatively, if they increase the convenience of driving and reduce cost, will they instead increase vehicle

miles traveled and energy demand in road transport? What happens to CO₂ emissions if power for electrification is generated by coal?

Marianne Kah (Presiding)
Senior Research Scholar, Columbia Center on Global Energy Policy

Lewis Fulton

Director, STEPS (Sustainable Transportation Energy Pathways), UC Davis Institute of Transportation Studies

Amitai Bin-Nun

Vice President, Autonomous Vehicles and Mobility Innovation, Securing America's Energy Future

Paul Leiby

Distinguished Research Scientist, Oak Ridge National Laboratory

DUAL PLENARY SESSION: ENERGY ENTREPRENEURSHIP AND FINANCE

10:30am - 12:00n • Interlocken A

This session explores changes in the private securities industry are giving private companies unprecedented access to a wide range of equity and debt institutional funding – and giving institutional investors (including family offices, sovereign wealth funds, private equity, hedge funds, banks, venture capital, pension funds, and strategic investors) access to curated, targeted equity and debt investment opportunities. Panelists will probe challenges facing local and international investment in energy infrastructure projects – and why some succeed and others fail.

Tina Vital

Managing Director, Castle Placement LLC

Robert Fenwick-Smith

Founder and Managing Director, Aravaipa Ventures

Ambassador Robert C Perry

Director – Africa, The Stevenson Group

Greg Taylor

Partner, Sequoia Investment Management Company

CLOSING PLENARY SESSION: ENERGY TRANSITIONS - LEARNING THROUGH HISTORY

12:00n - 1:30pm • Interlocken BCD

Energy markets have changed drastically in the past few years but this panel will seek to answer the question: have the changes been any different from what's gone on previously? Sometimes a person's perspective on

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history is set by their own time span, which may be limited. Our discussion will hear from people who have been watching energy markets and ecosystems change and change again for many years. They will give us their perspective on just where the current shifts stand compared to what has gone on before. A push to decarbonize fuels as the world deals with the reality that oil and natural gas supplies won't be in anything resembling a tight market for the foreseeable future is a paradigm that we haven't seen previously. But there have been other upheavals in the past as well. Where do our current changes stand compared to the shifts of the past? People who know their history will help provide answers.

John Kingston (Presiding)
Executive Director and Oil Market
Expert, FreightWaves

Richard Newell
President and CEO, Resources for the
Future

Amory Lovins
Cofounder, Chief Scientist, and
Chairman Emeritus, Rocky Mountain
Institute

TOUR THE NATIONAL RENEWABLE ENERGY LABORATORY (NREL) ENERGY SYSTEMS INTEGRATION FACILITY

1:30 p.m. – 5:00 p.m. • Golden, CO
(Separate registration required)

We will meet and board the bus at the Omni Interlocken Hotel lobby at 1:30 p.m. sharp and drive to NREL, where their staff will conduct the tour. At the end of the tour we will board the bus for the trip back to the Omni. Please note that because of traffic, we cannot guarantee a return time to the hotel, so please plan your flights and reservations accordingly.

THURSDAY, NOV. 7

TOUR NOBLE ENERGY'S O&G PRODUCTION FACILITIES

7:00am – 5:00pm (est.) • DJ Basin
(Separate registration required)

We will travel to Greeley Colorado. On route, Noble staff will provide us an overview of their operations in the Denver-Julesburg (DJ) Basin. In Greeley, we will tour the NOSTC, a full-scale training facility and competency center that features simulated operations equipment.

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NOTES