

ARPA-E GO Competition Challenge 1 Outreach Event

Tuesday, February 18, 2020

Renaissance New Orleans Arts Warehouse District Hotel
700 Tchoupitoulas Street, New Orleans, LA 70130

7:00 – 8:00 am: Breakfast (Patrons Foyer – Lobby Level)

GO Competition Overview (Patrons Salon III-IV – Lobby Level)

8:00 – 8:10 am: Introduction: Lane Genatowski, *Director of ARPA-E*, and Kory Hedman, *ARPA-E*

8:10 – 8:15 am: Steve Elbert, *PNNL*

8:15 – 8:25 am: Carleton Coffrin, *LANL*

Key Industry Speakers

8:25 – 8:45 am: Kwok Cheung, *General Electric*

8:45 – 9:05 am: Edward Rothberg, *Gurobi*

9:05 – 9:25 am: Patrick Panciatici, *RTE*

9:25 – 9:45 am: **Coffee Break**

Entrant Team Presentations and Panel

9:45 – 10:45 am: Panel discussion (selected entrant teams by ARPA-E: LLNL, Lehigh, Georgia Tech, and CU-Boulder)

The Future of GO and Closing

10:45 – 10:55 am: Dick O’Neill, *ARPA-E – Challenge 2 and the Future of the GO Competition*

10:55 – 11:00 am: Closing Remarks

Poster Session and Networking (Patrons Salon I-II – Lobby Level)

11:00 – 1:30 pm: Networking Event: Poster Session with GO Competition Entrants and Industry

12:30 – 1:30 pm: **Lunch**

Optional Meetings with ARPA-E

1:30 – 5:00 pm: By Request: Availability for one-on-one meeting with ARPA-E

External Speakers

KWOK CHEUNG

*Director of Global Market Management Solutions
General Electric (GE) Grid Solutions*

Dr. Kwok W. Cheung received his Ph.D. degree in Electrical Engineering from Rensselaer Polytechnic Institute, Troy, NY. He joined GE (formerly ESCA) as a power system engineer developing on-line dynamic security assessment and energy management solutions in 1991. From 1995-2008, he held various technical lead and management positions responsible for the design and implementation of many leading energy and transmission markets worldwide including Transpower (New Zealand), Australian Energy Market Operator (AEMO), ISO New England, PJM, ERCOT and Midcontinent ISO. In 2008, he became the R&D Director of Market Management Systems managing a worldwide engineering group to research, develop and maintain market management products and related smart grid solutions. Since 2015, he has been the Director of Global Market Management Solutions (MMS) of GE Grid Solutions responsible for managing the overall worldwide businesses and product solutions for MMS. Dr. Cheung has authored and co-authored over 100 technical papers published in international journals and conference proceedings. Dr. Cheung is a registered Professional Engineer of the State of Washington, a Senior Fellow of GE and a Fellow of the IEEE.

PATRICK PANCIATICI

*Senior Scientific Advisor
RTE-France*

Patrick Panciatici, graduated from Supélec (Electrical Engineering School in France), he joined EDF R&D in 1985 then joined RTE (French Transmission System Operator) in 2003. He participated in the creation of the internal R&D department of RTE. He has more than 30 years experience in the field of R&D for transmission systems. Presently, as senior scientific advisor, he inspires, coordinates and supervises long term research activities at RTE while advising the board of directors on strategic plans. He is the RTE representative in different initiatives including in USA: PSERC (Power Systems Engineering Research Center, <https://pserc.wisc.edu>) and Bits and Watts (Stanford University initiative focused on innovations for the 21st century electric grid, <https://bitsandwatts.stanford.edu/>). He is member of CIGRE, Fellow of IEEE and Emerite member of SEE.

ED ROTHBERG

*CEO
Gurobi*

Dr. Edward Rothberg is CEO and co-founder of Gurobi Optimization, LLC. Ed has a PhD in Computer Science from Stanford University, and has held senior leadership positions in optimization software companies for the past twenty-five years.

Invited Entrant Speakers

KYRI BAKER

*Assistant Professor, Electrical Engineering
University of Colorado, Boulder*

Dr. Kyri Baker received her B.S., M.S., and Ph.D. in Electrical and Computer Engineering from Carnegie Mellon University in 2009, 2010, and 2014, respectively. From 2015 to 2017, she worked at the National Renewable Energy Laboratory. Since Fall 2017, she has been an Assistant Professor at the University of Colorado Boulder. Her research focuses on developing computationally efficient optimization algorithms for energy systems ranging from building-level assets to transmission grids.

COSMIN G. PETRA

*Computer Scientist, Center for Applied Scientific Computing
Lawrence Livermore National Laboratory*

Cosmin G. Petra holds a computer scientist position in the Center for Applied Scientific Computing at Lawrence Livermore National Laboratory. Cosmin's work focuses on numerical algorithms for and high-performance computing solvers for mathematical optimization with emphasis on applications in complex energy systems. Prior to joining Lawrence Livermore National Laboratory, Cosmin was with Argonne National Laboratory as a computational mathematician and, prior to that, hold software engineer/numerical analyst positions in the IT industry. Cosmin obtained an M.S. and a Ph.D. in Applied Mathematics from the University of Maryland, Baltimore County, in 2006 and 2009, respectively.

ANDY SUN

*Associate Professor, Industrial and Systems Engineering
Georgia Institute of Technology*

Dr. Andy Sun is an associate professor and the Anderson-Interface Early Career Professor at the H. Milton Stewart School of Industrial and Systems Engineering in Georgia Institute of Technology. Dr. Sun's research focuses on developing new optimization models and algorithms for large-scale power system computation, such as OPF, unit commitment, transmission switching, and stability analysis. He has collaborated with the utility industry on robust unit commitment and renewable integration.

ANDREAS WÄCHTER

*Professor, Industrial Engineering and Management Sciences
Northwestern University*

Andreas Wächter is a Professor in the Department of Industrial Engineering and Management Sciences at Northwestern University. He obtained his master's degree in Mathematics at the University of Cologne, Germany, in 1997, and this Ph.D. in Chemical Engineering at Carnegie Mellon University in 2002. Before joining

Northwestern University in 2011, he was a Research Staff Member in the Department of Mathematical Sciences at IBM Research in Yorktown Heights, NY. His research interests include the design, analysis, implementation and application of numerical algorithms for nonlinear continuous and mixed-integer optimization. He is a recipient of the 2011 Wilkinson Prize for Numerical Software and the 2009 Informs Computing Society Prize for his work on the open-source optimization package Ipopt.

GO Competition Support Team Invited Speakers

CARLETON COFFRIN

Staff Scientist

Los Alamos National Laboratory

Dr. Carleton Coffrin is a staff scientist in Los Alamos National Laboratory in the Advanced Network Science Initiative, an interdisciplinary team that investigates the application of emerging optimization and machine learning methods to problems in critical infrastructure systems. Dr. Coffrin's work focuses on developing novel optimization methods for network design, operation, and restoration for AC power networks. In addition to peer-reviewed publications, his work on power system optimization has been recognized by the IEEE PES 2014 Optimal Power Flow Competition and Los Alamos National Laboratory's Early Career Researcher award. Dr. Coffrin received his Ph.D. in Computer Science from Brown University in 2012, under the supervision of Pascal Van Hentenryck. Before joining Los Alamos National Laboratory in 2016, Dr. Coffrin was a staff scientist at NICTA, Australia's premier computer science research laboratory.

STEVE ELBERT

Senior Member, Optimization and Control Group

Pacific Northwest National Laboratory

Dr. Stephen Elbert is a senior member of the Optimization and Control Group within the Electricity Infrastructure and Buildings Division of the Energy and Environment Directorate at Pacific Northwest National Laboratory. Dr. Elbert's work focuses on the use of high performance computing to solve critical, energy related problems. He has over 23,000 citations on Google Scholar. Dr. Elbert has a Ph.D. in Theoretical Chemistry from the University of Washington under National Academy of Science member and National Medal of Science winner Ernest R. Davidson. Before joining PNNL he was a Senior Solutions Scientist at IBM, a Program Director at NSF (CISE) and DOE (ASCR), and Director of the Scalable Computing Lab at Ames Laboratory.

ARPA-E Speakers

LANE GENATOWSKI

Director

Advanced Research Projects Agency-Energy

Lane Genatowski is the Director of the Advanced Research Projects Agency-Energy (ARPA-E), responsible for oversight and leadership of the Agency. Prior to joining ARPA-E, Director Genatowski served as Senior Advisor to the Under Secretary for Science at the U.S. Department of Energy. Before entering government service Mr. Genatowski was a managing partner at Dividend Income Advisors, a firm he founded in 2012 to invest in energy and power industry companies. Before founding Dividend Income Advisors, he led the Power Investment Banking Group at Wells Fargo Securities, LLC and held senior energy investment and management positions at Jefferies & Company, Inc., JP Morgan Chase, Kidder, Peabody & Co. and Bank of America. He began his career in the energy sector practicing law at Hawkins, Delafield & Wood in New York City. Director Genatowski received a bachelor's degree in Economics from the City University of New York, and his Juris Doctor from Fordham University School of Law.

KORY W. HEDMAN

Program Director

Advanced Research Projects Agency-Energy

Kory W. Hedman currently serves as a Program Director at the Advanced Research Projects Agency-Energy (ARPA-E). His focus at ARPA-E includes electric power systems, power systems operations and planning, management of renewable and distributed resources, power flow control technologies, and electric energy markets. Prior to ARPA-E, Hedman was an Associate Professor at Arizona State University. In 2017, President Obama awarded him the Presidential Early Career Award for Scientists and Engineers. Hedman holds six degrees. He earned an M.S. and Ph.D. degrees in operations research from the University of California, Berkeley. He also earned an M.S. in economics and the M.S. in electrical engineering, both from Iowa State University. He holds a B.S. in electrical engineering and a B.S. in economics, both from the University of Washington.

RICHARD P. O'NEILL

Distinguished Senior Fellow

Advanced Research Projects Agency-Energy

Dr. Richard O'Neill currently serves as a Distinguished Senior Fellow at the Advanced Research Projects Agency - Energy (ARPA-E). Prior to his time at ARPA-E, O'Neill served as the Chief Economic Advisor at the Federal Energy Regulatory Commission (FERC) and as the Director of FERC's Office of Pipeline and Producer Regulation. During his time at FERC, O'Neill led the Chairman's teams to develop policy and restructure the natural gas and the electric power markets, develop oil-pipeline rate index by benchmarking to actual industry costs, and increase the efficiency of FERC's market software. Further, O'Neill led a group that developed transmission switching software that would ultimately become an ARPA-E project and was integral to the initial design of ARPA-E's Grid

Optimization Competition. O'Neill has served on the computer science and business faculties at Louisiana State University and the University of Maryland, where he holds a B.S. in chemical engineering, an MBA, and a Doctorate in operations research.

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