



IEEE International Conference  
on Quantum Computing  
and Engineering – QCE20



## QCE20 Workshop on Quantum Computing Opportunities in Renewable Energy

Times are given in Mountain Time (MT, UTC-6)

### Session 1

**10:45-10:50 Welcome** Zach Eldredge (DOE), Annarita Giani (GE Research)

**10:50-11:20 Keynote *Potential Quantum Computing needs across the Renewable Energy Sector*** Danielle Merfeld, CTO GE Renewable

**11:20-11:50 Keynote *Computing advancements for renewable energy integration – will there be a quantum leap?***

Zhenyu (Henry) Huang, Ph.D., P.E., F. IEEE Laboratory Fellow, PNNL; Research Professor, Washington State University

**11:50-12:15 Quantum Computing for Renewable Energy**, Zach Eldredge (DOE), Annarita Giani (GE Research)

**12:15-13:00 Break**

### Session 2

**13:00-13:15 *Quantum Computing of Aluminium Fumarate as a Model for CO2 Capture by Metal Organic Frameworks***, Gabriel Greene-Diniz, David Zsolt Manrique, David Muñoz Ramo, Cambridge Quantum Computing, Elvira Shishenina, Philip Llewellyn, Total SA

**13:15-13:30 *Quantum Machine Learning for Predictive Analytics*** Himanshu Thapliyal, **University of Kentucky**

**13:30-13:45 *Simulating organic semiconductors on a noisy quantum computer: What model Hamiltonians can do for you***, Eric Jones, **NREL**

**13:45-14:00 *Scalable demand response scheduling for renewable energy integration through Quantum Computing***, Javad Mohammadi, **CMU** and Mohsen Rahmani, **D-Wave System**

**14:00-14:15 *Practical implementation of quantum optimization algorithms for wind farms design***, Marouane Salhi, **Qubits Engineering**

**14:15-14:30 *Designing Energy-Efficient Quantum Computers Through Prediction and Reduction of Cooling Requirements for Cryogenic Electronics***, Michael Martin, Caroline Hughes, Gilberto Moreno, Eric Jones, David Sickinger, Sreekant Narumanchi and Ray Grout, **NREL**

**14:30-15:15 Break**

### Session 2

**15:15-15:30 *Quantum Computing for Mixed-Integer Linear Programming***, Chin-Yao Chang, **NREL**

**15:30-15:45 *The Quantum Approximation Optimization Algorithm Applied to the Unit Commitment Problem***, Samantha Koretsky, Pranav Gokhale, Jonathan Baker, Madeline DeVoe, Fred Chong, **Univ. Chicago**, Olivia Del Guercio, Honghao Zheng, Niroj Gurung, **Commonwealth Edison**, Amin Khodaei, **University of Denver**

**15:45-16:00 *A Quantum Chance Constrained Binary Optimization (QCCBO) Algorithm***, Peter Graf and Eric Jones, **NREL**

### 16:00-16:40 Panel Discussion

- Ceren Susut-Bennet, DOE
- Laurent White, ExxonMobil (Dual Energy Challenge)
- Witold Kowalczyk, Zapata Computing (Sustainability)
- Karl Thibault, Q4Climate Initiative

Presentations - 20 mins

Discussion - 10 mins

Questions from audience - 10 mins

**16:40-16:45 *Final remarks, next steps***, Zach Eldredge (DOE), Annarita Giani (GE Research)