**Governing Green Power: Aligning Old Institutions To Fit New Technologies**

University of Hawai`i – Mānoa, March 28-30, 2017

Technology and institutions coevolve. Institutions can encourage or discourage innovation and adoption of technologies. Technological change, in turn, can drive institutional change. This dynamic has reached a critical phase in the electricity sector where low-cost and subsidized intermittent renewable energy is upsetting old models of grid management and stability. The broad public challenge, in Hawai`i and elsewhere, is to achieve power systems with a large share of renewable energy at the lowest possible cost while giving careful attention to matters of fairness.

The dialogue focuses on the institutional changes needed to accomplish this. The invited scholars, practitioners and policy makers come from the Islands, the Mainland and internationally. This website provides an overview and will be the forum through which its results can be widely distributed and discussed.

**Monday, March 27, 2017**

6:00 - 8:00pm Welcoming Reception - New Otani Kaimana Beach Hotel

**Tuesday, March 28, 2017**

7:45 – 8:45 **Continental Breakfast**

**9:00 – 10:15 Session 1: Welcome, Introductions, Conference Goals and Process**

9:00 – 9:05 Dick Pratt: Brief welcome

9:05 – 9:20

Michael Roberts: Motivation and goals for the conference.  
*Although clean energy goals themselves are an important part of debate, we want to put that issue aside and focus on how the institutions themselves need to change to make the overall system more efficient and more equitable.*

9:20 – 9:30 Brief introductions by everyone (10 seconds or less)

9:30 – 9:40 Governor’s remarks

9:45 – 9:55 Dick Pratt: Outline conference process and schedule

9:55 – 10:15 What each participant sees as the most important issue or issues

**10:15am - 10:30am Break**

*Format for the sessions:*

- Brief introduction of topic by facilitator.

- Context presentation (10 minutes or less).

- Primary responders (7 minutes or less each).

- Open dialogue.

- Wrap-up of main points (5 minutes or less).

**10:30 - 11:50 Session II: Current Institutions and Challenges with Intermittent Renewables**

*What currently works well, what doesn’t and why? How can market-based power systems (ISOs/RTOs) better integrate transmission, intermittent renewables, distributed generation and demand response into a more holistically integrated system.*

Facilitator: Dick Pratt

Presenter: Matthias Fripp, UHM College of Engineering and UH Economic Research Organization

Primary Responders:

Matthew White, ISO New England

Steven Puller, Texas A&M University - Economics

Carl Freedman, Haiku Design and Analysis

Jay Griffin, Hawaii Natural Energy Institute

Wrap-Up: Robbie Alm, Collaborative Leaders Network

**12:00 - 1:20 Lunch**

**1:30 - 3:00 Session III: What are the Benefits if We “Get it Right” and the Consequences if We Don’t?**

*Dynamic, marginal-cost pricing and open access to the grid can lower costs and help integrate renewables; without them, we could have grid defection, and spiraling costs for those who cannot defect.*

Facilitator: Meredith Fowlie, *UC Berkeley Agricultural and Resource Economics and Energy Institute at Haas*

Presenter: Michael Roberts, *UHM Economics, Sea Grant, and UH Economic Research Organization*

Primary Responders:

Duncan Callaway, *UC Berkeley Energy and Resources Group*

Richard Rocheleau, *Hawaii Natural Energy Institute*

Maria Tome, State of *Hawai`i PUC*

Richard Barone, *Hawaiian Electric Companies*

Severin Borenstein, *UC Berkeley Haas School of Business and Energy Institute*

Wrap-Up: Katrina Jessoe, *UC Davis Agricultural and Resource Economics*

**3:00 - 3:20 Break**

**3:20 - 4:50 Session IV: Markets and Natural Monopolies: How has Technology Changed the Case for Regulation?**

*Natural monopoly in generation diminished decades ago, but market power still exists in transmission and distribution. To what extent have renewable energy and complementary technologies changed the degree and nature of natural monopoly, and therefore the overarching case for regulation? If we look 5-10 years out, does natural monopoly diminish or disappear?*

Facilitator: Makena Coffman*, UHM Urban and Regional Planning and UH Economic Research Organization*

Presenter: Severin Borenstein, *UC Berkeley Haas School of Business and Energy Institute*

Primary Responders:

Richard Newell, *Duke University Nicholas School of the Environment and Resources for the Future*

Nori Tarui, UHM Economics and University of Hawaii Economic Research Organization

Colton Ching, *Hawaiian Electric Companies*

Stephen Hollan,*UNC Greensboro Economics*

Terry Boston,*former**CEO and President of PJM Interconnection*

Wrap-up: Jim Bushnell, *UC Davis Economics and Berkeley Energy Institute*

**5:30 - 8:00 Dinner Reception at College Hill**

**Wednesday, March 29, 2017**

**8:00 - 8:30 Continental Breakfast**

**8:30 - 10:00 Session V: Institutional Changes in Response to Renewables: How are Technology and Institutions Co-Evolving?**

*How have institutions already changed as a result of renewables? What are the consequences of these changes? Have the changes worked as intended? What are the unintended consequences?*

Facilitator: Dick Pratt

Presenter: Terry Boston*Former**CEO and President of PJM Interconnection*

Primary Responders:

James Bushnell, *UC Davis Economics*

Dave Parsons, *Hawaii PUC*

Isaac Moriwake, *Earthjustice*

Mike Yamane or David Bissell, *Kauai Island Utility Cooperative*

Regina Finn, *Lucerna Partners*

Wrap-Up: Richard Wallsgrove, *Blue Planet Foundation*

**10:00 - 10:20 Break**

**10:20 - 11:50 Session VI: New Ideas for Making Market-Based Power Systems Work Better with Renewable Energy**

*Electricity markets continue to evolve, in part to deal with issues of market power, and in part because renewable energy is causing greater price variability. What can be done to make these markets work more efficiently?*

Facilitator: Meredith Fowlie, *UC Berkeley Agricultural and Resource Economics and Haas Energy Institute*

Presenter: Steven Puller, *Texas A&M University Economics*

Primary Responders:

Regina Finn, *Lucerna Partners*

Matthew White, *ISO New England*

Alex Papalexopoulous, *ECCO International, Inc.*

Matthias Fripp,*UH Manoa* *Engineering an*d *University of Hawaii Economic Research Organization*

Wrap-Up: Carl Bonham, *University of Hawaii Economic Research Organization*

**12:00 - 1:20 Lunch, Center for Korean Studies lobby**

**1:30 - 3:00 Session VII: New Ideas for Utility Regulation with Renewable Energy**

*How can incentives be improved? Some propose performance contracts with utilities, and these exist in certain capacities. What metrics ought to be used? Are alternative organizational structures, like government municipalities or cooperatives, any better? Are market-oriented solutions possible at the distribution level or for smaller grids like Hawai`i’s? If so, how?*

Facilitator: Makena Coffman*, UHM Urban and Regional Planning and UHERO*

Presenter: Meredith Fowlie, *UC Berkeley*

Primary Responders:

Michael Roberts, *UHM Economics, Sea Grant, and UHERO*

Alex Papalexopoulous, *ECCO International, Inc.*

Duncan Callaway, *UC Berkeley Energy and Resources Group*

Mark Duda, *Hawaii PV Coalition*

Dean Nishina, *Division of Consumer Advocacy*

Wrap-Up: Rene Kamita, *Division of Consumer Advocacy*

**3:00 - 3:20 Break**

**3:20 - 5:00 Session VIII: Transitioning to a Fairer and More Efficient System: Is there a QWERTY problem?**

*What are the key obstacles preventing transition to fairer and more efficient governance systems? How can they be overcome? How should regulatory designs be adjusted in light of pre-existing institutional constraints?*

Facilitator: Dick Pratt

Presenter: Carl Freedman, *Haiku Design and Analysis*

Primary Responders:

Mina Morita, *Energy Dynamics*

Katrina Jessoe, *UC Davis Agricultural and Resource Economics*

Beia Spiller, *Environmental Defense Fund*

Douglas Codiga, *Schlack Ito*

Dean Nishina, *Division of Consumer Advocacy*

Wrap-Up: Mark Glick, *Hawaii Natural Energy Institute*

**Thursday, March 30, 2017**

**8:00 - 8:30 Continental Breakfast**

**8:30 - 10:00 Session IX: Summary and Recommendations**

**10:00 - 10:20 Break**

**10:20 - 11:20 Session X: Next Steps**

*Where do we go from here? What are the critical questions that require theoretical or empirical answers and how should we go about answering them?*

Conference Sponsors ((NOTE FROM DICK We are hoping to have logos from these. Needs to be in alphabetical order wherever placed.)

* Department of Economics, UHM
* University of Hawai`i Economic Research Organization (UHERO)
* Sea Grant, UHM
* College of Engineering UHM
* College of Social Sciences UHM
* Ulupono Initiative
* Blue Planet Foundation
* Hawaiian Electric Company
* Hawaii Energy Policy Forum
* Collaborate Leaders Network Hawaii
* The Sierra Club

Suggested Readings

General Interest:

Perez-Arriaga and C. Knittel *Utility of the Future* MIT (2016) energy.mit.edu/uof.

J. Lazar Electricity Regulation in the US: A guide Second Edition The Regulatory Assistance Project (2016) <http://www.raponline.org/knowledge-center/electricityregulation-in-the-us-a-guide-2>.

J. Lazard Lazard’s *Levelized Cost of Energy Analysis – Version 10.0.* [This has a warning against reproduction and distribution without permission on every page. Do want to use it?]

M. Pollitt Lessons from the history of independent system operators in the energy sector, with applications to the water sector. University of Cambridge - Electricity Policy Research Group (August 2011) http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.900.8839&rep=rep1&type=pdf

R. Walton How regulations and technology brought us closer to utility 20 in 2016. Utility Dive (Dec. 2016) http://www.utilitydive.com/news/how-regulations-and-technology-brought-us-closer-to-utility-20-in-2016/432803/

Hawai`i Focused:

M. Fripp *Making an optimal plan for 100 % renewable power in Hawaii - Prelilminary Results from the SWITCH power system planning model.* (January 2016) <http://www.uhero.hawaii.edu/assets/WP_2016-1.pdf> [Okay to use this?]

UHERO What a difference a rate makes (May 2016) <http://www.uhero.hawaii.edu/news/index/category:10>





