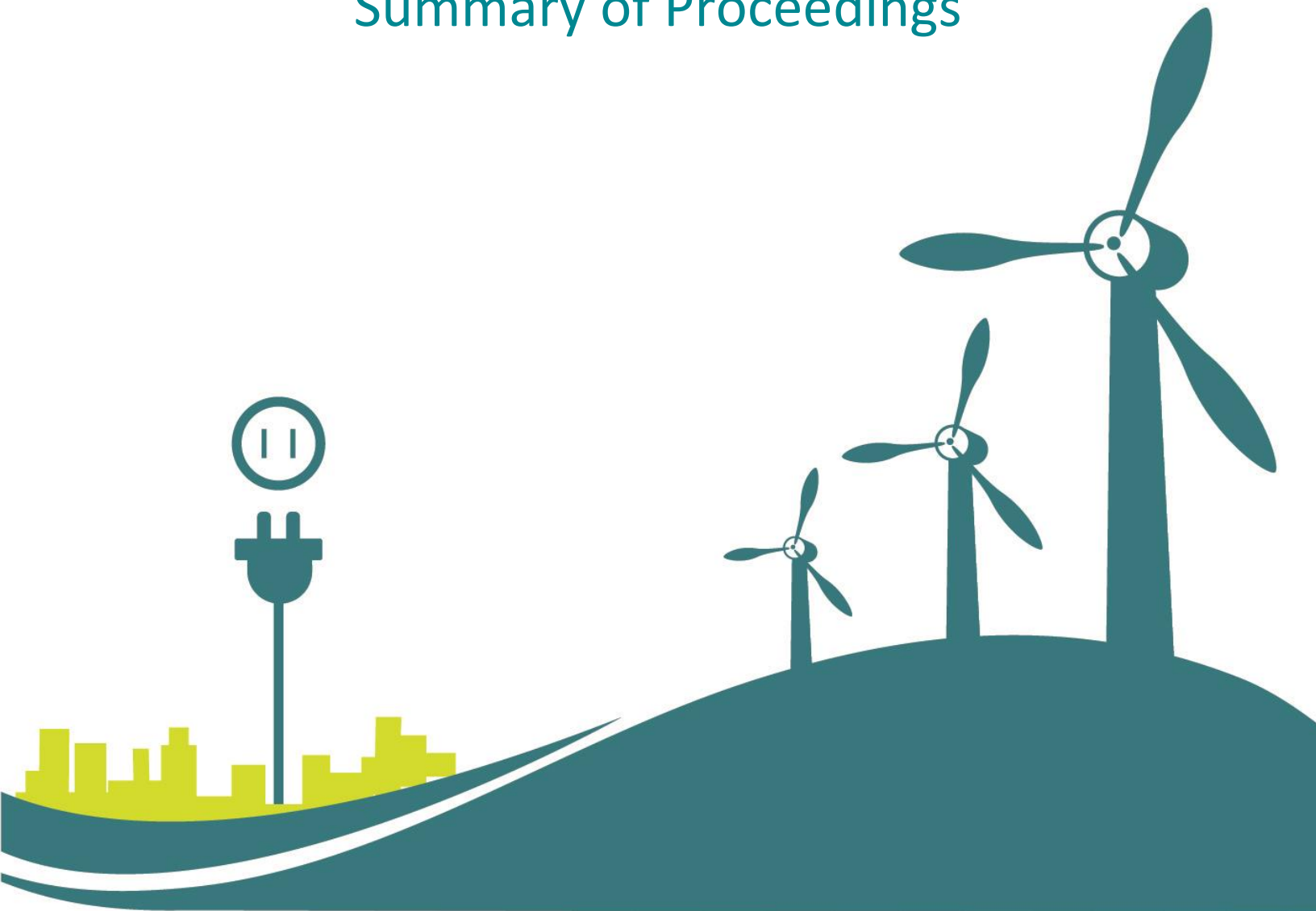


A Focus on the Customer



March 25-27, 2015 | Maui Arts & Cultural Center

Summary of Proceedings





MAUI ENERGY CONFERENCE + EXHIBITION

A FOCUS ON THE CUSTOMER

Summary of Proceedings

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CONFERENCE PROGRAM

WEDNESDAY | March 25

7:00 AM **REGISTRATION | Founders Courtyard**

8:00 **TRADITIONAL BLESSING & OPENING | Castle Theater**
Kapono'ai Molitau, Kumu Hula, No Hanona Kulike O Pi'ilani

E KOMO MAI (WELCOME)

Teena Rasmussen, Economic Development Director, Maui County
Jeanne Unemori Skog, President & CEO, Maui Economic Development Board, Inc.

REMARKS

Alan Arakawa, Mayor, Maui County

8:20 **NEXTERA AND HAWAIIAN ELECTRIC: TOGETHER, FOCUSED ON THE CUSTOMER**
Introduction by **Doug McLeod**, Chair, Conference Program Committee

Alan Oshima, President & CEO, Hawaiian Electric Company
Eric Gleason, President, NextEra Energy Hawaii

9:50 **SESSION 1: UNDERSTANDING THE EVOLVING ROLE OF THE | Castle Theater**
CUSTOMER IN A BROADER CONTEXT

The electricity sector is part of a larger trend in which “power” is flowing down, literally and figuratively, to the level of the customer. From customers becoming producers to local governments seeking to make energy in a manner consistent with local values, the trend is toward decentralized, “democratized” energy. This panel asks how this trend will play out for customers of electric utilities.

Moderated by:

Jonathan Koehn, Regional Sustainability Coordinator, City of Boulder

Henry Curtis, Executive Director, Life of the Land

John Farrell, Director, Democratic Energy, Institute for Local Self-Reliance

S. David Freeman, American Engineer, Attorney, and Author





10:50

SESSION 2: THE CUSTOMER OF THE 21ST CENTURY

A growing number of energy consumers are shifting to “pro-sumers,” and more customers are demanding a voice in managing their energy needs. This session will explore customer choices, their access to the grid, and what rate options and programs are available or should be available to provide expanded customer choice. Is leaving the “grid” an option and if so are there ways to make it attractive to stay connected? How do “greener” energy options at potentially higher costs fit in? What choices will be available to those who are essentially tied to the grid - renters, homeowners who cannot afford the costs of PV?

Moderated by:

Jay Griffin, Chief of Policy and Research, Hawaii Public Utilities Commission

Neil “Dutch” Kuyper, Chief Executive Officer, Parker Ranch, Inc.

Hunter Lovins, President, Natural Capitalism Solutions

Justin McCurnin, Vice President & General Manager, Smart Grid Solutions, Honeywell

Jon Yoshimura, Director of Policy and Electricity Markets, SolarCity

1:20 PM

SESSION 3: ARE WE SEEING WHAT THEY'RE SEEING: | **Castle Theater** CUSTOMER PERCEPTIONS ON ENERGY

How can customer perceptions be determined and used effectively in policy making? To elicit a community's cultural and social values on energy requires an effective process that puts the customer front and center in designing our energy future. Since the rejection of the last utility led Integrated Resources Planning (IRP) in Hawaii last year, we have been developing new methods of outreach and education on energy topics which will be discussed in this panel.

MPowerMaui: An Energy Conversation

A Presentation of Results

Jeanne Unemori Skog, President & CEO, Maui Economic Development Board, Inc.

Moderated by:

Fern Tiger, Principal and Creative Director, Fern Tiger Associates

David Bissell, President & CEO, Kauai Island Utility Cooperative

Jeff Mikulina, Executive Director, Blue Planet Foundation

Will Rolston, Energy Coordinator, County of Hawaii

Jeanne Unemori Skog, President & CEO, Maui Economic Development Board, Inc.



3:00

SESSION 4: ADVANCING TOWARD GRID MODERNIZATION | Castle Theater MEETING CUSTOMER NEEDS

Increasing amounts of distributed and utility scale renewable energy, along with strategic deployment of efficiency resources will require modernized grids. How does customer needs drive advancements in grid technology for the utility operator?

This session will explore how customer needs have evolved, with greater ability to both self-generate and manage electricity usage driving new ways to capture value for both the customer and incumbent energy provider. Advanced technology, entrance of new providers, and technology advancements along with modernized grids create new opportunities as well as threats to energy resiliency.

Moderated by:

Maurice Kaya, Program Director, Energy Excelsator, Pacific International Center for High Technology Research

Jim Alberts, Senior Vice President, Customer Service, Hawaiian Electric Company

John Cooper, U.S. Business Development Manager, Business Transformation & Engineering Solutions, Siemens Industry, Inc.

Tad Glauthier, Vice President, Hawaii Operations, STEM Inc.

Alicia Moy, President & CEO, Hawaii Gas

4:00

SESSION 5: THE GROWTH OF DISTRIBUTION GENERATION – GOOD OR BAD FOR THE CUSTOMER?

Utilities have seen unprecedented growth in distributed generation as a customer reaction to rates and an interest to move to a renewable energy future. This session will explore how distributed generation is changing the customer landscape. What role do Microgrids play in increasing DG penetration, grid enhancement, and customer choice? What are the benefits of adding storage on the customer side of the meter? Bottom Line: It boils down to Customer Choice.

Moderated by:

Sebastian “Bash” Nola, Utility Consultant

Mark Duda, President, Hawaii PV Coalition, and Founder, RevoluSun LLC

Dan Girard, Director, Renewable Energy and Energy Storage Business Development, S&C Electric Company

Mathew McNeff, Manager, Engineering, Maui Electric Company

Richard Rocheleau, Director, Hawaii Natural Energy Institute, University of Hawaii





THURSDAY | March 26

7:30

FOCUS ON THE CUSTOMER – MAUI STYLE | **Castle Theater**

(Optional session to be videotaped for later viewing)

Moderated by:

Frank De Rego Jr., Business Development Projects Director, Maui Economic Development Board, Inc.

Senator Rosalyn Baker, Chair, Senate Committee on Commerce and Consumer Protection, Hawaii State Legislature

Irene Bowie, Director, Maui Tomorrow

Carl Freedman, Owner and Principal, Haiku Design and Analysis

Kelly King, Vice President & Chief Communications Officer, Pacific Biodiesel, Inc.

Cathy Nobriga Kim, Vice President, Maui Soda and Ice Works

8:30

REFLECTIONS ON DAY ONE FROM THE PROGRAM COMMITTEE

Holly Benz, Vice President, Consulting, Schneider Electric

Jonathan Koehn, Regional Sustainability Coordinator, City of Boulder

8:40

CLIMATE AFFORDABILITY: GETTING TO GREEN AND KEEPING THE LIGHTS ON

Mark Toney, Executive Director, The Utility Reform Network

Slapping a “green” or “smart” label onto a policy does not always result in protecting the environment or consumers. This presentation elevates general principles and practical policies that promote affordable pathways to reducing greenhouse gases, as well as identifies policies masquerading as green energy initiatives that end up hurting low and moderate income customers.

9:10

HOW STATE ENERGY POLICY WILL HELP THE CUSTOMER

Luis Salaveria, Director, Department of Business, Economic Development & Tourism, State of Hawaii

10:00

SESSION 6: HOW CAN THE CUSTOMER BECOME AN ACTIVE PARTICIPANT IN THE ENERGY LANDSCAPE | Castle Theater

Customers can play a vital role in basic utility functions to improve efficiency and energy management. How do you engage the customer and encourage them to participate in these programs? How do you build “sticky” customer relationships in which the customer is paid for some services while paying for others? What do the next generation of energy services look like? Are customers going to have expanded choices? What are the benefits to the grid?

Moderated by:

Holly Benz, Vice President, Consulting, Schneider Electric

Deborah Kimberly, Vice President, Customer Energy Solutions, Austin Energy

Matt O’Keefe, Director, Market Development and Regulatory Affairs, Opower

Ray Starling, Program Director, Hawaii Energy Conservation and Efficiency Program

Kimberly Williams, Co-Founder and Managing Director, Solar Fuels Institute

11:00

SESSION 7: THE CHANGING REGULATORY COMPACT – THE CUSTOMER, THE UTILITY, THE REGULATOR

This session will explore how utilities are focusing on more than the typical utility operations to sustain and grow as a viable business entity. What does the future business model for the utility look like and how does the customer fit in? Are changes in the regulatory environment a necessity and what role does the investment community play in the utilities’ viability?

Moderated by:

Joe Viola, Vice President, Regulatory Affairs, Hawaiian Electric Company

Lorraine Akiba, Commissioner, Hawaii Public Utilities Commission

Jim Alberts, Senior VP Customer Service, Hawaiian Electric Company

Kyle Datta, General Partner, Ulupono Initiative

Raya Salter, Senior Utility Advocate, Natural Resources Defense Council

12:00 PM

SOCIAL INNOVATION: OUR VISION FOR THE CUSTOMER

Yasuo Tanabe, Vice President & Executive Officer, Government and External Relations, Hitachi, Ltd.



2:00

SESSION 8: CONSUMER PROTECTION | Castle Theater
WHO'S LOOKING OUT FOR THE CUSTOMER?

What programs and regulations are in place to protect the customer in this new world of energy/customer choice? How will regulations evolve to address fairness concerns as some customers become energy producers and others continue to depend solely on the utility? What other regulatory challenges that impact the customer are on the horizon? What are the privacy concerns for consumers as the electric grid becomes more interactive? For example: smart meters and consumer privacy.

Moderated by:

Thomas Gorak, Chief Counsel, Public Utilities Commission, State of Hawaii

John Howat, Senior Policy Analyst, National Consumer Law Center

Michael Jung, Policy Director, Silver Spring Network

Jeffrey Ono, Executive Director, Division of Consumer Advocacy,
Department of Commerce and Consumers Affairs, State of Hawaii

Mark Toney, Executive Director, The Utility Reform Network

3:20

ENGAGING CUSTOMERS IN A FRESH, NEW WAY | Castle Theater

Deborah Kimberly, Vice President, Customer Energy Solutions, Austin Energy

3:50

KEY TAKEAWAYS: WHERE DO WE GO FROM HERE?

Constance Lau, Chairman & Chief Executive Officer, Hawaiian Electric
Industries, Inc.

4:20

CLOSING REMARKS

Teena Rasmussen, Economic Development Director, Maui County

Jeanne Unemori Skog, President & CEO, Maui Economic Development Board, Inc.

4:30

CONFERENCE ADJOURNS

GLOSSARY OF ACRONYMS

CEO	Chief Executive Officer
DE	Distributed Energy
DG	Distributed Generation
DR	Demand Response
EE	Energy Efficiency
EVs	Electric Vehicles
HCEI	Hawaii Clean Energy Initiative
HECO	Hawaiian Electric Company
HELCO	Hawaii Electric Light Company (Big Island)
HNEI	Hawaii Natural Energy Institute (UH)
IOU	Investor Owned Utility
KIUC	Kauai Island Utility Cooperative
kW	Kilowatt
kWh	Kilowatt hour
LNG	Liquid Natural Gas
MECO	Maui Electric Company
mW	Megawatt
NEM	Net Energy Metering
NREL	Natural Resources Energy Laboratories
PSIP	Power Supply Improvement Plan
PUC	Public Utilities Commission
PV	Photo Voltaic
RC	Regulatory Compact
RE	Renewable Energy
RFP	Request for Proposals

WELCOME AND OPENING REMARKS

Teena Rasmussen, Economic Development Director, Maui County

- This conference program is timely and unique and will both challenge and inspire us to consider new models and emerging trends.
- Participant demographics:
 - 68% from private sector, 18% government; remainder non-profit or other
 - 32% from Maui; 26% international or mainland US; 42% from other Hawaiian islands

Jeanne Skog, President and CEO, Maui Economic Development Board, Inc., (MEDB)

- As conference co-presenter with the County, MEDB has extensive track record in energy (e.g. first energy conference on Maui in 1980s, development of Island Energy Inquiry K-12 energy curriculum, early adopter of rooftop PV, LEED-EBOM certification, JumpSMARTMaui.
- Conference goal is to illuminate the way forward in solving energy challenges regarding customer choices, prices, education, equity, infrastructure, and policy.

Alan Arakawa, Mayor, Maui County

- Despite falling oil prices, it is important to remember why we promote Renewable Energy (RE):
 - more affordable
 - freedom from external events
 - increased self-sufficiency and sustainability
- Maui RE goals remains 100%; already 30 to 35% and highest EV density in the world.
- Maui County is Maui Electric's (MECO) largest customer.
- Deregulation an important part of the conversation, allowing the free market to set prices and break monopolies.



Maui Mayor Alan Arakawa

KEYNOTE: NEXTERA AND HAWAIIAN ELECTRIC -- TOGETHER, FOCUSED ON THE CONSUMER

Doug McLeod, Chair, Conference Program Committee (former Energy Commissioner, Maui County)

- In December 2014, Hawaiian Electric Company and NextEra announced their planned merger. In the following discussion, “Together, Focused on the Customer,” the companies will present their thoughts on the customer relationship.

Alan Oshima, President and CEO, Hawaiian Electric Company (HECO)

- HECO and NextEra are aligned to achieve a more renewable future for Hawaii and the proposed partnership makes a lot of sense.
- HECO filed its Power Supply Improvement Plan (PSIP) with the Public Utilities Commission (PUC) in August 2014, which required HECO to devise a comprehensive plan for 2030:
 - 65% energy from renewables
 - triple the amount of distributed solar energy (to 900 mW)
 - bills lower by 20%
- Change is necessary and the utility transformation has several elements:
 - distributed PV: Currently 12% households statewide (54,000 in Hawaii)
 - Liquefied Natural Gas (LNG): Cleaner transition fuel to replace oil and price less volatile
 - grid modernization: Smart grid gives information and choices to customers and data to utilities. Pilot project involves 5,200 customers on Oahu
 - customer-centric products and services: Utilities have to be listeners and implementers of technology, similar to cell phone industry progression over the last 20 years. Utilities must provide a sense of value to customers, as well as options and choice.
 - electric vehicles (EVs): Hawaii is a natural test bed because of limited distances
 - regulatory model changes involving multiple partners
- NextEra is US leader in clean energy and leads world in wind power. With economies of scale and presence in multiple states, its innovation and RE knowledge is transferable to Hawaii.

Eric Gleason, President, NextEra Energy Hawaii

- NextEra’s largest asset is Florida Power and Light (FP&L).
 - 4.7m customers
 - typical utility bills 25% less than national average
 - electricity more affordable (less than 10c per kWh)
 - oil imports reduced from 40m. barrels in 2001 to 0.2m. in 2014

- emphasis on customer value proposition, clean and reliable energy
- early adopters of smart meter technology
- Next Era assets in 25 states and Canada; world's largest RE generator from wind and sun.
- Rationale for HEI/NextEra merger includes:
 - opportunity for clean energy transformation using unique natural resources
 - “Postcard from the Future” – meeting unprecedented RE integration challenges
 - complementary strengths, adding value for customers and making a real difference
- Benefits of merger for Hawaii customers:
 - clean, reliable, affordable energy
 - continued commitment to local community and appointment of local advisory board
 - commitment to existing employees: Current employment levels and pay/benefits for 2 years
 - industry-leading partner for the state of Hawaii



Keynote Speakers (from left to right): Alan Oshima and Eric Gleason with Doug McLeod

Summarized Q&A Session (Moderator: Doug McLeod)

Q: Why is the price of LNG less volatile than oil?

AO: A smaller percentage of the delivered price of LNG reflects actual product cost, compared to oil. Because LNG is sourced from North America, it is less geo-politically sensitive.

Q: What is the expected role of utility-scale storage in the energy transformation?

AO: HECO is currently working on an RFP for 200mW of battery storage. Prices are expected to fall and economies of scale are expected to favor utility-scale storage rather than smaller (residential) scale.

EG: Pumped hydro storage is another interesting option. Storage technology is rapidly evolving and could be a potential game-changer.

Q: What is the role of energy efficiency?

AO: Energy efficiency is the best way to allow for more RE at the least cost.

Q: How do micro-grids affect HECO's business model?

AO: There are no black and white answers; Hybrid grids would probably benefit all of our customers. If structured correctly, micro-grids will be a part of the energy future.

Q: How do smart meters benefit customers?

EG: By predicting outages, improving reliability, and cost savings.

Q: How will changes in customer energy generation be embraced by NextEra?

EG: NextEra embraces it and supports our shared RE goals and HECO's resolution of the interconnection process.

AO: Technology breakthroughs will continue to expedite the process.

SESSION 1: UNDERSTANDING THE EVOLVING ROLE OF THE CUSTOMER IN A BROADER CONTEXT

The electricity sector is part of a larger trend in which “power” is flowing down, literally and figuratively, to the level of the customer. From customers becoming producers to local governments seeking to make energy in a manner consistent with local values, the trend is toward decentralized “democratized” energy. This panel asks how this trend will play out for customers of electric utilities.

Panel Moderator Jonathan Koehn, Regional Sustainability Coordinator, City of Boulder

- Boulder is an example of a municipal utility that is taking a more customer-centric approach. In thinking about “the utility of the future,” Boulder is pursuing the three “D”s of energy:
 - Democratization
 - Decentralization
 - Decarbonization
- This panel discussion will consider whether the future holds gradual evolution or revolution for utilities and the energy landscape as well as the changing role of the customer.

John Farrell, Director, Democratic Energy, Institute for Local Self-Reliance

- Energy is becoming democratized, taking advantage of technological transformation to distribute power and economic benefits as widely as possible.
- This new model contrasts with the former centralized energy monopoly, focused on economies of scale and providing reliable and affordable electricity with rates that included environmental and social costs.
- The former utility model may have made sense once but discourages innovation and created anomalies such as Arizona, a sunny climate, that is 80% reliant on coal power.
- We are in a time of fundamental change, with EVs, smart appliances, smart meters, and cell phones controlling consumption remotely.
- A key is how to change the rules to allow customers to capture opportunities for energy savings.

Henry Curtis, Executive Director, Life of the Land

- The energy revolution offers vertical integration, like the NextEra model, or a decentralized smart grid model. A third alternative, often dismissed, is a fully distributed model, with integration of different forms of RE that also offers resilience against physical or cyber-attacks.
- A distributed system means infrastructure is separate from the grid, with batteries, EVs that can power homes, and smart phones to control usage and keep track.
 - utility role would be to help each customer maximize their own micro-grid, offering greater reliability and resilience
 - micro-grids break ties with the central grid, while the service-providing utility can monitor and provide maintenance
 - the value to the utility is grid stabilization, load balancing, and grid security

S. David Freeman, American Engineer, Attorney and Author

- The energy revolution is underway.
- Unlike the monopoly utility model, the fundamentally changing landscape means that customers can purchase power from alternative suppliers and utilities no longer have an exclusive relationship with their customers.
- These changes are a great opportunity to eliminate fossil fuels and avoid catastrophic climate change which is a real threat.
- US utilities have a choice to grow or die. We need action, not words -- and we need to pursue a renewable future. For example, utilities should be developing EV car batteries.
- LNG is not the answer; it is a fossil fuel and would be like switching cigarette brands.



Panelists (from left to right): Henry Curtis, David Freeman, John Farrell, with Jonathan Koehn

Summarized Q&A Session (Moderator: Jonathan Koehn)

Q: How can utilities shift to a service orientation, from generation and transmission?

DF: Utilities need to offer energy efficiency (EE) services, build storage infrastructure and integrate it with solar and wind resources.

JF: Utilities can offer a suite of services as electric power is democratized with micro-grids, PV, etc. The prime responsibility of IOUs is to shareholders and they typically have an undemocratic decision-making process. In NY State, regulators are not allowing utilities to control DG.

Q: How can we design a grid system with a democratic decision-making process?

DF: We need vibrant competition between energy newcomers and utilities. The technology is here but time is running out because of climate change.

HC: It only takes one blackout to experience disaster, and a smart grid is still vulnerable to attack. We need to “island” parts of the system or separate them off.

Q: How do we make the transition from fossil fuel?

HC: Create energy service companies for each island as a democratic project to take communities off the grid. This is an opportunity to test different models.

DF: We can survive a blackout but not climate change. We must replace fossil fuel with RE, and transform the transportation sector needs as well as power generation.

JF: DE is a reality now and spreads economic benefits. We need to move towards both RE and decentralized systems, breaking the existing economic and policy monopolies. Incumbent utilities have too much say in the way the energy system will develop.

Q: What is the role of the customer in light of the proposed merger which may be in the public interest for HECO but not necessarily MECO or HELCO?

DF: The customer is now in charge. The consensus is for more RE, more efficiency, and to solve climate change. Utilities have to get onside or die. We need to help them understand the new paradigm.

Q: Who will drive and direct the change?

JF: There are several choices: Regulators, legislators, utilities, customer choice and competition.

DF: The environment will drive it. The climate issue will drive the public to demand RE. With PV, wind and other technologies, we have invented the “better mousetrap.” Utility management just needs to get out of the way now.

HC: Having more players is a good thing. Three major factors are driving change: the popularity of rooftop solar and a falling price for PV; large corporations paying huge bills; and entrepreneurs stepping up to profit from inventing technologies for change.

Q: What three milestones do you want NextEra to implement in Hawaii?

JF: 100% RE by 2030; unlimited opportunities for PV solar; ambitious policy for the public benefit.

Q: What will be key issues raised in this conference?

HC: The PUC must rule on docket issues such as decoupling, PSIP, interconnection, net metering, and the proposed merger by June 2016 making this a critical period.

DF: The next year needs to bring that “Postcard from the Future” and RE to Hawaii. Maui can show how to reach 100% RE, and it should be a condition of the merger.

JF: Determine leverage points and use election pledges and utility contract renewals to effect it. This merger is one such point of leverage.

SESSION 2: THE CUSTOMER OF THE 21ST CENTURY

A growing number of energy consumers are shifting to “pro-sumers,” and more customers are demanding a voice in managing their energy needs. This session will explore customer choices, their access to the grid, and what rate options and programs are available or should be available to provide expanded customer choice. Is leaving the grid an option and if so, are there ways to make it attractive to stay connected? How do “greener” energy options at potentially higher costs fit in? What choices will be available to those who are essentially tied to the grid such as renters and homeowners who cannot afford the costs of PV?

Panel Moderator Jay Griffin, Chief of Policy and Research, Hawaii Public Utilities Commission

Energy customers have more choice than ever and will continue to demand affordable, clean, reliable energy. Technology and innovation are making RE increasingly available to more customers, and the regulatory and policy landscape must also evolve.

Justin McCurnin, Vice President and General Manager, Smart Grid Solutions, Honeywell

- Honeywell Smart Grid Solutions serves 60 utilities in five countries, enabling 500,000 homes with demand response technology. As a matchmaker bringing energy efficiency solutions to customers, there are three important issues:
 - identify the customer
 - assess what motivates the customer
 - plan how best to communicate with the customer
- We identify the customer and assess energy needs by using external data on age, income, type and age of home, etc. and use predictive modeling.
- Important to send the right message to the right customer and differentiate as necessary. The right data and marketing can make a great impression and increase customer motivation.
- These strategies prove cost-effective and result in higher response rates despite potentially higher costs involved; the same is true for commercial customers.

Jon Yoshimura, Director of Policy and Electricity Markets, Solar City

- Solar City's customers are a subset of HECO's and have certain expectations:
 - opportunity to participate in Hawaii's transition to cleaner, less expensive energy
 - given interconnection delays, customers look to policymakers and regulators for protection from arbitrary restrictions
 - recognition of, and fair and honest resolution to, technical and economic obstructions
 - availability of options and reasonable timelines for installation and approval
- Recent timeline of PV installation issues:
 - September 2013: HECO introduce NEM approval requirement pre-installation
 - October 2013: HECO initiate transient over-voltage issues (decried by Steven Chu, then-US Energy Secretary). NREL and others partner to review issues
 - January 2015: HECO announces raising the Daytime Minimum Load screen from 120% to 250% per circuit
- Net energy metering (NEM) has led to a utility revenue loss of \$53 m. that represents a subsidy by non-solar users to support solar customers. But all ratepayers can benefit from NEM.
- Regarding storage, Governor Ige has said: "We need to increase investment in batteries and figure out how we can get them into the grid."

Neil "Dutch" Kuyper, CEO, Parker Ranch, Inc.

- The rising frustration with HECO and its apparent actions to avoid a transformation from fossil fuel generation is striking.
- Parker Ranch (Big Island) is partnering with Google, NextEra, Hawaii Gas and Siemens for energy alternatives. The transformational process can produce a shared outcome.
- In considering whether HECO has been good for Hawaii, it is important to consider the negative qualities of monopolies:
 - not price-competitive
 - no incentive to invest in innovation
 - slow to change
 - significant potential for lost opportunity costs and customer losses
 - lack of transparency
 - vulnerable to technology changes
 - interest in snuffing out competition
 - shareholder value favored over customer/ratepayer value
- HECO does not properly assess customer value, which was not measured in the PSIP.

- Parker Ranch supports DBEDT's three guiding principles:
 - diversity of energy portfolio
 - balance between technology, economic, environmental and cultural considerations
 - use of market-based principles and price structures
- Hawaii needs to pursue this transformation within 10 years or less. The Big Island should be prioritized because customers pay the highest rates, yet has the best natural resources.
- Important issues to be addressed next:
 - responsibility for absorption of stranded assets costs: shareholders or ratepayers?
 - should the utility monopoly continue?
- Parker Ranch proposes:
 - transition of NEM from residential to wholesale rates over 7 or 8 years
 - acceleration of PSIP from 15 years or more to 7 or 8 years

Hunter Lovins, President, Natural Capitalism Solutions

- Grid-connected PV means resilience.
- LNG is a potential multi-kiloton bomb threatening environmental disaster.
- Gas and oil may be cheap now, but they won't always be. Price volatility is never good.
- Next Era merger means fossil fuel use will continue (LNG and oil).
- Goal of 65% RE by 2030 is embarrassing; the Mayor has called for 100% within 10 years, which is absolutely feasible and will drive job creation.
- Once the initial capital cost of RE is paid off, the energy created is free.
- RE must be the goal because we are in a horserace with catastrophe. Climate change is here and it will not be kind anywhere; it is the biggest issue of our time.
- Estimates put interisland cable costs at \$1 billion. Imagine the results if \$1 billion was spent on rooftop solar. Don't study it – do it!
- European utilities are divesting their fossil fuel businesses and investing in RE. We have the technology we need to resolve the energy crisis at a profit.
- Like any customer, if I like the utility I'll stay connected. If not, I'll use PV and storage and be the face of the utility "death spiral." The future is DG.
- For customers, the future is up to you.

Summarized Q&A Session (Moderator: Jay Griffin)

Q: What are the collaborative opportunities (win-wins) with the incumbent utility?

JM: Depends on the needs of customer segments; solutions may not be the same for all.

JY: Products companies such as solar can provide what customers will invest in, so utilities win too with a reliable grid at lower cost – a triple win that benefits all ratepayers.

DK: There is great value in all stakeholders talking, getting educated, and collaborating. The State can also influence the outcome. NEM represents a threat to utilities as it reduces revenues; a huge amount of profit is on the line – up to \$600 million.

HL: Solar energy is free, and the utilities and customers can make the investment to capture the “free”. We all know that a monopoly is not the best model for customers. Therefore we need broad deregulation involving the State to force the utility to do what is in the customers’ best interests. Any delay just constrains the economic growth of the islands.



Panelists (from left to right): Hunter Lovins, Neil “Dutch” Kuyper, Jon Yoshimura

SESSION 3: ARE WE SEEING WHAT THEY'RE SEEING? CUSTOMER PERCEPTIONS ON ENERGY

How can customer perceptions be determined and used effectively in policy making? To elicit a community's cultural and social values on energy requires an effective process that puts the customer front and center in designing our energy future. Since the rejection of the last utility-led Integrated Resources Planning (IRP) in Hawaii last year, we have been developing new methods of outreach and education on energy topics which will be discussed in this panel.

Panel Moderator Fern Tiger, Principal and Creative Director, Fern Tiger Associates

- Consumer understanding and the potential to engage everyday people in the complex issues related to energy decisions and policymaking is invaluable. Users make better decisions when they have relevant, trusted information.
- Surveys tell us that utilities know that it's important for customers to be informed, and that they spend significant time and resources educating them.
 - 76% said customer education is a higher priority than 10 years ago, but rate themselves poorly at it.
 - less than 2% rated themselves as "great;"
 - less than 30% (only) rated themselves as "doing a good job."

Jeanne Skog, President and CEO, Maui Economic Development Board, Inc.

- MEDB has a long track record in large-scale community engagement through its Focus Maui Nui process that began over 10 years ago reaching 1,700 residents in 170 small group sessions.
- **MPower Maui** engaged Maui residents and gathered information about customer preferences and priorities.
 - Goal: to engage a cross-section and bring their voices to this conference, particularly those not typically participating in these issues
 - To document their perceptions, concerns, support for, and awareness of, potential future directions and perceived impediments to energy goals and utility strategies
 - Small group sessions (12+/-), an exercise in listening (not lecturing)
 - 435 participants took part in 43 sessions over 5 weeks. In addition 1,477 Maui Fair survey participants took part
- MPower Results: Greatest motivations to save energy at home:
 - 87%: "saves money"
 - 54%: "health of the planet"

- 40%: “good for Maui”
- MPower participants grade selves, and Maui residents, as less energy-conscious than did Fair survey respondents; Fair survey respondents graded selves higher than Maui as a whole
- MPower “Power Pack” (card deck listing issues) rated priority issues:
 - Cost of electricity (93% of sessions)
 - Dependence on fossil fuel (88%)
 - Environmental impacts (84%)
 - Changing lifestyles to conserve (70%)
 - Infrastructure improvement (56%)
- MPower community trade-offs:
 - Would support another wind farm **if** ...storage was in place/had more information on environmental and cultural impacts
 - Would support tripling of PV **if**...No “if,” just do it! Or: There is equity in spreading the cost reduction
 - Would support LNG **if**...only used for transition. 20% said no to LNG; comments and objections cited LNG as an imported fuel, or cost and safety issues
 - Reduced dependence on fossil fuel should not come **at the cost of**...livelihoods/higher bills/dependence on other imports/environmental impacts
 - Safety and reliability are important, **but also**...providing choice/good environmental stewardship/RE future
- MPower messages from participants were invited, for the utility, government, or Maui. Many were inspirational and forward-thinking:
 - Utility: keep profits in proportion; support RE; make electricity affordable; support innovation; lack of trust and transparency
 - Government: change the lack of transparency; need for greater regulation; desire for collaboration; provide incentives; listen to the community
 - Maui: importance of community pride and responsibility; need to stay informed; participate in the process; conserve energy
- MPower session evaluations:
 - 98% felt actively engaged
 - 97% “felt heard”
 - 90% learned something
 - 95% trusted the presenter and felt the session was objective
- Main conclusions:
 - Major community concerns were: high energy costs, environmental health, cultural issues, affordability and equity for all, preference for PV, lack of knowledge, importance of choice, importance of collaboration, and importance of trust.

David Bissell, President and CEO, Kauai Island Utility Cooperative (KIUC)

- KIUC is the only energy cooperative in Hawaii. There are 900 in the US, located in 47 states serving 40m. customers.
- KIUC goal of 50% RE by 2023.
- Of seven guiding principles for KIUC, three relate to communication:
 - Democratic member control (one member one vote)
 - Voluntary and open membership; can vote for Board of Directors (nine Directors)
- Provision of education, training, and information to member/owners
- Acting on member feedback makes KIUC stronger, and good communication is essential
 - Biggest issue is decreasing bills
 - Members want fair rates and no subsidies between rate classes
- Acknowledgement that KIUC needs to be as transparent as possible.
 - Monthly Board meetings
 - Annual meeting
 - Frequent newsletters
 - Members can appeal actions through petition process (twice in last two years)
- Communication is a challenge whatever type of utility, but easier for a cooperative because there are no shareholders to satisfy, just member-customers.

Jeff Mikulina, Executive Director, Blue Planet Foundation

- There is an important role to play for third parties in facilitating communication. Until now, communication has mostly been one-way, but customers are much more engaged now so good communication is essential.
- Blue Planet (BP) helped HECO communicate to customers about smart meters (2014). BP is trusted by the community on issues of clean energy, and consumer trust is vital.
- BP canvassed 5,000 homes on Oahu, hosted Open Houses and assisted messaging, especially the value proposition for customers, e.g. “Smarter Homes, Stronger Communities – Smart Meters.”
- Campaign featured use of cartoon characters: Eve of the Future, MisoSmart, Kid Capacity.
- Main challenges: language and cultural barriers, access of canvassers to secure buildings, skepticism of utility intentions, lack of interest in issues (30 to 40%).
- What worked to make campaign effective:
 - A recognized and trusted third-party so that people listened
 - Face-to-face interaction, which encouraged trust
 - Images, illustrations and videos
- Main results:
 - Opt-out rate less than 0.5% out of 5,000 (fewer than 30).
 - Customers became more participatory

- Communication on energy issues is more essential than ever
- Island Pulse project (display monitors showing electricity generation by source set up in public places) another good way of communicating with customers

Will Rolston, Energy Coordinator, County of Hawaii

- In Hawaii, each island has different issues and business models may need to differ, but cost and resiliency are consistently important.
 - Kauai: a cooperative model works well
 - Hawaii: resources include geothermal, wind, solar, and historically, OTEC
 - Molokai and Lanai have voiced their preferences
- Customers also need a vision for the future.
- Important to communicate project options, otherwise utilities will be unable to get customers' opinion.



Panelists (from left to right): Jeanne Skog, Will Rolston, Jeff Mikulina, David Bissell, Fern Tiger

Summarized Q&A Session (Moderator: Fern Tiger)

Q: Is it feasible for the Maui utility to become a cooperative?

DB: The scale and financial capacity are there to make it practical. Criteria are (a) are there a willing seller and buyer? (b) is there a groundswell of public support – a ground-up initiative is needed.

Q: How realistic is it to continue an MPower kind of community engagement? Or is it a one-off?

JS: It's a healthy process that met with high receptivity. We encourage highly as it gives valuable information but it is very labor intensive.

WR: On the Big Island, the community is very receptive to receiving information, but it's important not to "crowd out" alternative options; for example, with our biofuel project. It may be time-intensive to educate the community now but it can save time later.

Q: How can utilities build trust?

DB: Through actions: deliver what you promise. Be truthful, and communicate.

JS: Customers should be part of the equation; it's no different to other large businesses.

Q: How can third parties balance lobbying for a utility as well as for legislation that may not be popular with the utility? How can trust be preserved when you are on both sides of the issue?

JM: The baseline is clearing a path for clean energy in Hawaii. We need to be unambiguous, and distinguish ourselves from the utility. At the same time, we can collaborate with the utility.

JS: For MEDB's MPower, there was typically an expectation that we had an agenda, but the design was critical in demonstrating there was not. MEDB has a beneficial reputation as a neutral convener.

JM: It's important to explain we're all in this together; third parties can be a catalyst for community issues.

Q: What is the downside to smart meters?

JM: There's a balance of trade-offs. It's the best technology, and the benefits outweigh the concerns.

Privacy is an important trust issue, but an integrated grid depends on smart meters for information.

Q: What are Kauai rates and current projects?

DB: Rates are about 30 cents per kWh, down about 25% over the last few months; but we have little economies of scale. A west-side pumped storage project is currently underway on Kauai.

SESSION 4: ADVANCING TOWARD GRID MODERNIZATION: MEETING CUSTOMER NEEDS

Increasing amounts of distributed and utility scale renewable energy, along with strategic deployment of efficiency resources will require modernized grids. How do customer needs drive advancements in grid technology for the utility operator? This session will explore how customer needs have evolved, with greater ability to both self-generate and manage electricity usage driving new ways to capture value for both the customer and incumbent energy provider. Advanced technology, entrance of new providers, and technology advancements along with modernized grids create new opportunities as well as threats to energy resiliency.

Jim Alberts, Senior Vice President, Customer Service, Hawaiian Electric Company

- Greater collaboration is needed; there is more agreement than disagreement and we must build on these consensus choices: more RE, lower bills, resiliency, greater customer choice.
- Major drivers of change are all moving at a different pace: markets, grid modernization, customer expectations, technology, and public policy. We need to synchronize as a system.
- Challenges of a customer-focused strategy during the energy transition:
 - As we create more segments, who is accountable to customers for outcomes?
 - Investment cycles and technology (e.g. inverters) may not match the pace of change
 - Diversity of options raises issues of risk management
 - Fairness, equality and sustainability are important – while preserving choice. The right balance is necessary between individual needs and the community as a whole.
- Opportunities of a customer-focused strategy during the energy transition:
 - Optimization of resources as a system (not just each part)
 - Greater transparency and engagement
 - Technology creates options and fosters a culture of innovation
 - Connecting the right solution to problems (e.g. Energy Excelsior, On-Bill Financing).
- HECO is dedicated to a focused strategy of transformation to enable customers and provide choices and options.
- Sustainability of choice is critical.
- Long-term view essential yet technology is changing fast, so we cannot take on too much risk.

Joe Bolvin, Hawaii Gas

- Hawaii Gas' propane and synthetic natural gas supply Hawaii with the equivalent of 2.5m. barrels of oil p.a. Used for cooking, heating, drying, seed drying, transportation.
- There have been increasing customer inquiries about new technologies for lowering costs and increasing reliability. Customers are moving forward to implement their own solutions; some are grid-connected, others not.
- This tells us there is a major shift in the market and that customer needs are changing.
- Challenges for us and other energy providers:
 - We are all linked to imported oil (55m. barrels p.a. at two refineries). For gas, crude oil is our single source of supply
 - Both Hawaii's refineries are facing declining demand (HCEI and efficiencies); since 2009, there has been a 20% decline for oil products. Refineries vital to Hawaii energy supply.
- Since 2014 Hawaii Gas has imported LNG shipments. LNG is proving reliable and cost-effective.



Panelists (from left to right): Tad Glauthier, John Cooper, Joe Bolvin, Jim Alberts, Maurice Kaya

John Cooper, US Business Development Manager, Business Transformation & Engineering Solutions, Siemens Industry, Inc.

- Perspective from the business lens of infrastructure and business innovation (based at Austin Energy, TX). Implemented the first smart grid in North America and more recently, involved in distributed energy and communications, designing an energy internet.
- Consumer Maturity Model: Progression from consumer passivity or unawareness, through awakening, become active and mobilizing, engaged (e.g. conserving energy), committed (an innovating “prosumer”), and finally united: networking prosumers and community aggregation.
- Transformation occurring in a complicated, dynamic environment of “disruptive innovation.”
- Innovation Cycle Model: From epiphany, through grief at the loss of the old paradigm, then acceptance, followed by mastery and innovation of a new paradigm. As that becomes obsolete, the cycle repeats. Utilities have to deal with this on multiple levels.
- With technology and customers widely diversifying, utilities do not have adequate budget for marketing.
- Utilities must develop new skill sets and turn to working with third parties, at least initially.
- Utilities need customers, and the reverse is true: “Can’t we all just get along?”

Tad Glauthier, Vice President, Hawaii Operations, STEM Inc.

- STEM is a Silicon Valley-based Excelerator start-up, founded in 2009, and leader in distributed energy (DE) storage. The Excelerator brought us to Hawaii sooner than we otherwise would.
- STEM designs and builds products based on batteries sourced from major manufacturers (not a battery company.) Give value by maximizing how the battery is used: e.g. cloud-based energy intelligence platform and provides utilities with flexible capacity.
- MEDB’s MPower showed cost is #1 issue; our value is to minimize cost, for example by peak-shaving. By reducing load peaks we lower customer demand charge, typically by 15 to 20%.
- Software interface showing load, solar production, battery status is an important piece for customer engagement, creating a much stronger bond between the customer and energy use.
- Project with HECO on grid response and sustainability involving linking 25 locations each with multiple battery “towers,” connecting to a 1mW grid. Scalable model and fast-responding.
- In 2016, planning an 85mW distributed storage system with SoCal Edison with five-year build-out: the time for distributed storage has arrived.

Summarized Q&A Session (Moderator: Maurice Kaya, Program Director, Excellerator, Pacific International Center for High Technology Research)

Not all customers are created equal and they possess different motivations. Energy service providers are working to become adept at being responsive to customer segments.

Q: How do you move pro-actively in an increasingly responsive direction?

JA: HECO started a transformational launch, starting with helping our employees embrace change.

Utilities have an obligation to serve and we must continue to be reliable and cost-effective throughout the transition. This is as important as the transition itself.

JB: First step is recognizing there is an issue, then putting together an appropriate market response.

JC: The more informed and activated consumers you have, the better off you'll be. In a time of climate and technological change, expecting all the innovation to come from the utility is unrealistic. Each community must step up and take some of the responsibility and offer ideas and cooperation.

TG: With storage there is a market for partnership. Storage may seem anti-utility but we believe a long-term strategy for success with facilitation is the best way to get customers and utilities to work together.

Q: What needs to happen in order to address the needed interface between the business side and the structure of the regulatory framework?

JC: In every community, the utility is the central figure, providing an essential commodity. Opportunities are increasing for multiple groups in the business community to also play a role. Because we have older rules, regulators are trying to adapt to the transformation as well as stakeholders. Often utilities are limited by regulations in terms of innovation and risk. Just as cell phone apps provide an ever-expanding system of services, there are multiple ways in which personalization of utility service can develop.

JA: We can help by working together and finding common alignment to speed up the process. Customer expectation is to work through the process as quickly as possible.

Q: A resilient future must take into consideration the existing infrastructure. How do we maintain a balance with risk management involved in long-term investments, and technologies such as LNG?

JB: With a larger scale natural gas program, we would seek to avoid stranded assets. The numbers cited for bringing natural gas to Hawaii are substantially exaggerated and capital costs are amortized over a short period – say 15 years – and are a small part of the overall cost equation. The cost of living in Hawaii comes back to energy. If we can reduce that by 20 or 30%, the savings can be passed on to the customers.

SESSION 5: THE GROWTH OF DISTRIBUTED GENERATION – GOOD OR BAD FOR THE CUSTOMER?

Utilities have seen unprecedented growth in distributed generation (DG) as a customer reaction to rates and an interest to move to a renewable energy future. This session will explore how DG is changing the customer landscape. What role do micro-grids play in increasing DG penetration, grid enhancement, and customer choice? What are the benefits of adding storage on the customer side of the meter? Bottom Line: It boils down to Customer Choice.

Moderator Sebastian “Bash” Nola, Utility Consultant

Hawaii has led the nation in the development of rooftop solar PV. This presents an interesting challenge for customers, developers, and utilities. The introduction of storage batteries adds to the opportunities. The next anticipated leap is the development of micro-grids.

Mark Duda, President, Hawaii PV Coalition, and Founder, RevoluSun LLC

- In terms of understanding the choices faced by Hawaii’s PV customers, residential PV has fallen in cost and is cheap (less than 10 cents per kWh over a 25-year life) compared to MECO rates.
- The combination of PV and storage has already won customers over. Customers can add a battery system and still net less than utility rates.
- Development of DG cannot be controlled, only guided, because it’s cheaper and a less volatile source of energy. It’s also green, allows for choice, and independence from the utility.
- Trying to micro-manage DG is a waste of energy so we should just “get on with it”.

Mat McNeff, Manager, Engineering, Maui Electric Company (MECO)

- In terms of increasing DG, HECO is already a leader, with 12% of customers (51,000) statewide having rooftop solar providing nearly 400mW; 11,000 were approved in 2014 alone. Hawaii has four times the solar penetration as Arizona, the next highest state.
- MECO’s NEM program has 7,000 customers, providing over 47mW.
- MECO has filed proposal with The PUC to increase solar sustainably, safely, and reliably:
 - Proposal specifies equitable cost sharing; those without solar were estimated as subsidizing those with by \$52m. in 2014
 - Proposal honors existing agreements

- Proposal raises interconnection threshold from 120% to 250% of daytime minimum load
- Major effort to increase choices for customers; e.g. Community Solar for condo residents
- MECO vision for 2030: 65% RE; bills 20% lower; triple distributed solar; more customer options.

Dan Girard, Director, Renewable Energy and Energy Storage Business Development, S&C Electric Company

- Energy storage is the means for RE to be fully integrated into the power system. Strategically placed, storage can more easily allow up to 100% RE for any system.
- With energy storage, there are concerns for both utilities and consumers:
 - For utilities: Reverse power flow; over-voltage situations; grid stability; and infrastructure costs of increased RE.
 - For consumers: Getting online with PV and staying online during system events/outages; controlling own power generation.
- Issue of whether storage belongs on the utility side, or consumer side:
 - On utility side: Storage close to generation point results in less power loss. It allows power smoothing and frequency regulation on-site. It can also cover outages.
 - On consumer side: Allows for micro-grids and “islanding” from utility, can supply peak evening/nighttime RE, cover outages.
- S&C has installed 25 grid-connected storage systems to date, for 146mWh (20% world total) and 46mW (12% world total) – 52% of storage in North America.
- Five battery storage technologies currently: Lithium-ion; NaS; NaNiCl; lead acid (standard); and lead acid (advanced). Other technologies in the pipeline include flow batteries and flywheels.

Richard Rocheleau, Director, Hawaii Natural Energy Institute (HNEI), University of Hawaii

- Micro-grids can be defined as a group of interconnected loads and DE resources (often RE) with defined electrical boundaries that act as a single entity and can operate in grid-connected or islanded mode, providing energy security.
- Smart grids build on grid intelligence and use two-way digital information and advanced communication technologies to gather and act on information in an automated fashion.
 - Allow utilities to adjust and control many devices from a central location.
 - Intended to benefit both utility and customers through more efficient production and distribution of energy: improve reliability and reduced vulnerability; maximize system efficiency; reduce peak demand and expand DR capacity; enable flexible rate structures; greater control of DG resources.
- Storage can make an impact but reliability must be maintained and it takes time to ramp up conventional energy sources.

- Some energy issue solutions include: Smart grid; time of use rates to flatten load curves; battery storage; EVs if charged during daytime; advanced inverters with greater functionality; distributed DR to shave peak use.
- Grid Start – HNEI project. Established to develop, test and evaluate advanced grid architectures, enabling policies and new technologies for effective integration of RE resources and power system optimization.
- HNEI projects on Maui include:
 - Maui Smart Grid funded by DoE (began 2009);
 - Maui Advanced Solar Initiative to develop and demonstrate advanced PV inverter functionality (began 2012), funded by DoE and ONR; and
 - JumpSMARTMaui (began 2011), for integration of PV, wind, and EVs, funded by NEDO and Hitachi; Phase II began in 2013 for EV grid and virtual power plant integration.



Panelists (from left to right): Richard Rocheleau, Dan Girard, Mat McNeff, Mark Duda, “Bash” Nola

Summarized Q&A Session (Moderator: Sebastian “Bash” Nola)

Q: Why haven't we adopted micro-grids as a strategy?

RR: Micro-grids can help interface with the utility grid and integrate more RE, but not substantially.

Ideally, a combination of micro-grid and smart grid functionality is optimal.

DG: Need a distributed, overriding intelligence that drives and controls the system.

Q: For utilities, is there an optimal mix of DG and utility-scale resources since some DG is hard to control?

MM: DG is leading the way and centralized production needs to catch up.

Q: What will it take for residential-scale storage systems to be incentivized by State and Feds?

MD: Federal incentives exist so not a barrier. State tax environment has improved. The issue is less about incentives but more about regulatory issues.

MM: HECO is working on programs that would incentivize customers in exchange for grid benefits that storage can provide.

Q: What DG progress has there been in the last year?

MM: MECO's goal was to clear the interconnection queue, which has occurred. We are connecting more PV systems than ever.

Q: Should PV customers be required to install storage?

MD: It could be done by introducing rules or making it conditional.

Q: What would it cost customers to reach 100% RE through storage?

DG: Costs are just beginning to fall as it is a new technology, so it would be hard to quantify, but 100% RE would be very costly. For 80%, less so, per a Caribbean island study.

Q: Food for thought...Transportation is a sector that has seen a lot of electrification in Europe. How much more electrical power would be needed if Maui's transportation was electrified?

FOCUS ON THE CUSTOMER – MAUI STYLE

Moderator Frank De Rego, Jr., Director, Business Development Projects, MEDB, Inc.

Cathy Nobriga Kim, Vice-President, Maui Soda and Ice Works

Kelly King, Vice-President and Chief Communications Officer, Pacific Biodiesel, Inc.

Irene Bowie, Director, Maui Tomorrow

Carl Freedman, Owner and Principal, Haiku Design and Analysis

FDR: The conference proceedings so far have reminded us “we’re all in this together;” we have a common goal: clean, reliable, affordable energy in a community that can exercise real freedom of choice. A central issue is how to design a system or business model to optimize this goal. How should falling oil prices and utility bills affect our thinking about energy issues?

CNK: Energy is critical to my business; we have made changes and seen savings. Our usage and oil prices mean that the impact of going solar would be minimal. Different energy sources should help us but not necessarily to make us independent of utility energy costs.

IB: For our community, falling prices are a relief but there is a danger of complacency. Price volatility means oil prices will rise again so we need to keep focused on our RE goals.

KK: Important not to lessen our resolve: Now is the time to invest energy savings into RE and build infrastructure and the green economy. Senator Inouye told us in 2012, “Don’t blink, keep going towards the goal;” it is important that the next generation does not lose hope. HCEI saw a policy consensus and its values was incorporated into State statute to which we must stay committed.

CF: In maintaining a balance between clean energy and cheap energy, decision makers must keep the vision of clean energy despite price volatility. We need a roadmap we can stick to and communicate the vision of our destination – clean energy. For customers, RE surcharges on bills are a hard sell.

IB: Local government, community organizations as well as utilities have a role to play in educating the community on what needs to be done, on climate change, and geopolitical volatility. There needs to be a commitment to helping people understand the broader issues affecting energy.

KK: Until now, customer choice has focused on cheap power rather than the right choices. Education is important but we also need policies and mandates (e.g. for biodiesel) because time is running out. We already have a clear goal in the HCEI, and Governor Ige has committed to a goal of 100% RE, which is achievable, but we do need a road map.

FDR: Is the dichotomy between affordable and reliable energy false? Must 100% RE be more costly?

CNK: Realistically, I don't think 100% RE is feasible; it's more likely to be a blend of RE and fossil fuel. Because of policy and laws, we see additional energy charges rather than real progress. Customers need to see more immediate validation of additional charges. My business requires reliable energy and we may be at the point where we need to provide our own energy. If we make any investment, we have to see progress. Without progress, the customer will not trust you.

CF: There is a trade-off between RE and reliability. Moving towards RE cannot jeopardize reliability. 100% RE is an idealistic goal and may or may not be more expensive, depending on the roadmap. Regardless, if 100% RE is too expensive, we won't get there.

KK: I don't think we have to trade off reliability for RE and in the long term, DBEDT policymakers believe RE will pay off because of avoided imports. In addition, the green economy can bring jobs, energy security, less volatility and environmental improvement. If the State supports infrastructure and business opportunities, the investment will return several times over. The RE Policy Forum and Ulupono Initiative are jointly funding a cost-benefit study which will be shared with policymakers.

IB: Vulnerability due to fuel imports could open Maui to potential external threats.

CF: It is important not to get too hung up on numbers and percentages and refocus on resolute goals.

FDR: if you were asked to design a system that supports lower, stable prices and increased customer choice that takes us to a clean energy future and eliminates volatility, how would you create it?

CF: On the generation side, some is already just "happening" and largely a mish-mash. The challenge is to make the end-result as good as possible. The "how" and the resource mix are difficult to determine. With transportation (two-thirds of Maui's energy use), the "how" is very amorphous.

KK: We need smarter minds and technical experts advising our leadership and planning the energy portfolio mix based on Technical Readiness Level (TRL). Pacific Biodiesel has seen plenty of proposals for unproven types of fuel development (zero or low TRL). The US DoE uses TRL as a criterion for certain types of energy and technologies and accurate evaluation of proposal TRL is key.

IB: The wave energy project on Maui's North Shore is one example of proposal that never happened.

CF: In terms of the "how," we need to coordinate education, communication and leadership to make solutions happen. MEDB's MPower was inspiring as a listening exercise to determine what matters to customers. Customers need to support decision on major choices (e.g. LNG or interisland cable or EE investments) and any potential facility site must meet with community approval.

FDR: (To CNK) As a large consumer of electricity and transportation energy, how do you want to be involved in this conversation?

CNK: As part of the process and the solution and not just the audience. This avoids pushback.
Government participation in the process leads the business community to question the process, which should be voluntary and not mandated.

IB: MPower demonstrated the importance of trusted, accurate information and transparency. Examples of the opposite are the discussions regarding LNG, the landfill waste-to-energy project, and the undersea cable project. Social justice and environmental issues need to be taken into account.

CNK: As customers we may not be experts; our understanding goes as far as our electricity bill. Oil prices may fall but we see no significant drop in the bill. Education is a key to understanding the dynamics. We also need to reach youth to make effective progress; they are also more open-minded.

IB: The community needs to recognize the importance of getting involved and making the effort to become educated. Otherwise, developments will occur without community input.

FDR: Why doesn't the County of Maui use biodiesel for its vehicle fleet?

KK: Pacific Biodiesel started producing fuel 19 years ago, and the County garbage trucks were using biodiesel. The commitment has diminished over the years. In the early days there were concerns over fuel quality and there were no tests for standards. We are diesel engine experts and depended on our reputation. On Oahu, the County fleet has run on biodiesel since 2004 and the County of Hawaii is preparing to convert. It is upsetting that Maui is recognized by our customers (including the mainland) as our home island, yet there is no institutional support.

FDR: From a customer standpoint, will undersea cable from Maui to Oahu provide any benefits for Maui?

IB: The biggest issue the environmental community has is that Maui will be sending our RE to Oahu and having to import fossil fuel in return to meet our own needs.

FDR: Following customer listening, how best to put customer preferences into action?

CF: Listening and communication are two-way streets; it's not about convincing customers. Policymakers need to know what matters to customers.

KEYNOTE: CLIMATE AFFORDABILITY -- GETTING TO GREEN AND KEEPING THE LIGHTS ON

Mark Toney, Executive Director, The Utility Reform Network (TURN)

- TURN was founded in 1973 in CA. Current staff of 9 attorneys and 2 analysts who participate in over 100 public utility proceedings annually, representing consumers and ratepayers.
- TURN exercises policy leadership and very active in shaping CA state-level energy legislation. TURN's motto: "Lower Bills, Livable Planet."
- Led PAC that spent \$120,000 to defeat utility campaign (costing \$50m.) for ballot initiative that attempted to proscribe public power utilities.
- TURN's mission:
 - contain utility costs
 - provide leadership in Energy Efficiency (EE) policy, the cheapest way to reduce emissions
 - promote affordable Renewable Energy (RE)
 - demand corporate accountability from RE companies as well as utilities.
- The theme of this presentation is: "Leadership Challenges for Consumer Champions."
- Two key Leadership Challenges that are dual priorities that consumers must fight for:
 - Climate change: We must take action now because at some point, global warming cannot be reversed and it will destroy the planet.
 - Increasing economic inequality, a global trend that will cause strife and war, tearing asunder the social fabric of nations.
- Key issue is how to get the greatest carbon reduction for the least cost.
- Need for government to use regulatory powers to increase RE and reduce poverty.
 - In 2014, 714,000 households in CA had electricity shut off because of falling behind on payments, affecting 2m. residents, mostly children, depriving them of an essential service.
- Policy examples of negative Climate Affordability – bad for both climate and economic equality:
 - Fixed monthly charges.
 - Regressive charges that reduce bills relatively for "energy hogs."
 - Energy use is correlated with income and customers should be rewarded for lower use.
 - Prepaid utility bills, marketed by utilities to low income households.
 - These do not reduce usage or emissions as utilities claim.
 - Once the prepaid balance is exhausted, customers are "voluntarily terminated" so are not included in mandated statistics for shutoffs.
 - In addition, each part-payment involves a service fee.
 - Utility development of "pilot" EV charging stations.

- 60,000 charging stations in “pilot” in CA at cost of \$1bn. to ratepayers.
 - Numbers too large to qualify as “pilot” project (25% of total deployment needed)
 - Only certainty is utility’s 10% rate of return.
 - Shareholders should share the risk.
- Policy examples that support positive Climate Affordability:
 - In-kind block rates.
 - The more energy used, the higher the rate per kWh.
 - For PG&E (CA), baseline residential rate is 16c, increasing to 19c, 28c, then 34c for highest usage, providing incentive for conservation.
 - Climate Dividend.
 - A carbon tax paid to utilities by companies with high carbon emissions.
 - Utilities prefer to pro-rate dividends to benefit high-usage customers (regressive) but should mean more to low-users and low-income customers (progressive).
 - Solar Clothes Dryer Bill now in the CA legislature to allow clotheslines.
 - 30,000 Homeowner Associations have banned clotheslines affecting 2 to 3m. residents.
 - Drying clothes in the sun is a low-tech, low-cost option – no subsidy needed!
- Issue is not Regulation vs. Deregulation but regulation to protect the public interest versus regulation to protect corporate interests.
- Deregulated states have regulations that are just as complicated as regulated states but they are designed to restrict competition, minimize restrictions and maximize profit.
- TURN supports fair market regulation in the public interest that promotes maximizing standards for public safety, sustainability and affordability.
- TURN supports the concept of a “floor” so that utilities are the provider of last resort; no-one gets left out, left behind, or left in the dark.
- TURN supports strong regulations with the authority of enforcement.
- To be strong Consumer Champions, we all need to couple a commitment to reduce emissions to reducing economic inequality.

KEYNOTE: HOW STATE ENERGY POLICY WILL HELP THE CUSTOMER

Luis Salaveria, Director, Department of Business, Economic Development & Tourism (DBEDT), State of Hawaii

- Strong policy leadership is a central part of the discussion regarding energy and the customer.
- Policy without vision is merely rules. By definition, rules state what is allowable or not.
- Therefore policy without vision stymies innovation because innovation happens when people think and act beyond the boundaries of the possible to make things happen.
- Innovation is needed to achieve the vision of a clean energy future that is independent, environmentally and culturally appropriate, and adds value for consumers and businesses.
- A clean energy future aligns with State goals of economic development, growing jobs and raising incomes. It can be more than just about energy and can drive Hawaii's economic future.



Luis Salaveria

- The State has 5 energy policy directives that came into existence to address Hawaii's energy ecosystem that is evolving at an unprecedented rate and leads the nation:
 - Diversify the energy portfolio
 - Connect and modernize Hawaii's grids
 - Balance all technical, economic, environmental and cultural considerations
 - Leverage Hawaii's position as an innovation test-bed
 - Create an efficient marketplace that benefits both consumers and producers
- All eyes are on Hawaii, and how these directives are implemented will become a template of how clean energy can empower a community and the world.
- Hawaii's energy customers benefit with clean energy solutions made locally through greater choice about how, when and where they get their energy.
- Customer choice means leverage and power to make smart decisions and drives an efficient marketplace, which is absolutely not a zero-sum game; an efficient, interactive marketplace benefits both producers and consumers.
- Government role should be to lead with policies and initiatives that facilitate the development of market-driven solutions, attracting capital and entrepreneurs.
- State policies must further the development of customer choice and transparent information, empowering customers to determine what best suits their needs; choice is the bottom line.
- An efficient marketplace is the best solution for both producers and consumers. Consumers are more informed and energy-savvy than ever and innovation is happening as a result of demand.
- Increasing competition between producers will benefit consumers with lower costs; for example, PPA rates have declined as projects compete.
- An increasingly diverse energy portfolio will continue to make even greater impacts.
- Hawaii State policy is purposeful in stating that the market should decide and customer should be fair and active participants in the market. Government should not make choices for them or pick winners.
- Hawaii is the ideal setting and unique laboratory for the clean energy transformation, with its leadership in RE penetration; isolated, islanded grids; high energy costs; and connections to the Asia-Pacific region.
- Imagine the most isolated populated landmass in the world being 100% self-sufficient in energy.
- DBEDT's objective is to make broad policy determinations with respect to economic development in Hawaii and to stimulate economic development efforts that offer the most immediate promise of expanding our economy. The innovative energy sector represents that most immediate promise.
- The economic cycle will probably contract within 4 to 5 years and signs are already apparent. We must lay the foundation of true diversification now or a golden opportunity will be missed to truly transform Hawaii's service-based economy into an independent, knowledge-based one.
- In the next 4 to 5 years, therefore, the State's policies must be about choice, an efficient marketplace, and innovation.

SESSION 6: HOW CAN THE CUSTOMER BECOME AN ACTIVE PARTICIPANT IN THE ENERGY LANDSCAPE?

Customers can play a vital role in basic utility functions to improve efficiency and energy management. How do you engage the customer and encourage them to participate in these programs? How do you build “sticky” customer relationships in which the customer is paid for some services while paying for others? What do the next generation of energy services look like? Are customers going to have expanded choices? What are the benefits of the grid?

Moderator Holly Benz, Vice President, Consulting, Schneider Electric

A common theme shared by this panel is a passion for the customer and treating them not merely as ratepayers. They will share their thoughts about innovative ways in which customers can be engaged.

Matt O’Keefe, Director, Market Development and Regulatory Affairs, Opower

- Never underestimate the interest of consumers in their energy use or overestimate the attention they pay to the issue – learned from experience from working with 95 utilities and 55m. customers.
- Customers increasingly expect to offer more outbound communication (like banks and telecoms) and personalized information, and to have it when they need it.
- Typically, American consumers think about energy for only 10 minutes p.a. To best take advantage of those minutes, discuss EE opportunities, DR, and becoming a PV producer.
- There are significant moments that matter in the utility/customer interface that must be leveraged: opening of account; bill arrives; customer service call; utility report arrives; seasonal change; new smart meter; rate information; extreme weather; outage; contract anniversary.

Kimberly Williams, Co-Founder and Managing Director, Solar Fuels Institute (SFI)

- SFI is a consortium of scientists from around the world; founded in Telluride, CO – a similar environmental sensitivity as Hawaii: outdoorsy, and invested in sustainability and innovation.
- PV power has been called ‘artificial photosynthesis’, so we copy plants, making fuel from sunlight, water and air. The current buzzword is “carbon utilization”: Taking carbon out of the air and recycling it to make a renewable fuel.
- SFI spins off this resource into catalyst prototypes: the next generation, beyond advanced battery chemistry.

Ray Starling, Program Director, Hawaii Energy Conservation and Efficiency Program

- Suggested strategies for customers to become active participants in the energy landscape:
 - Always start with EE, the most cost-effective grid resource. Efficiency reductions yield comparable returns as firm generation reductions.
 - Treat customers as grid partners in the clean energy effort. Give them a good reason to stay, and educate them how to participate profitably in the clean energy grid.
 - Provide real-time price signals and smart meter infrastructure, allowing both buying and selling at variable rates that reflect positive or negative impacts on the grid.
 - Incentivize customers to adopt clean energy and motivate them to become active and valuable participants in the energy grid.

Deborah Kimberly, Vice President, Customer Energy Solutions, Austin Energy

- Public utilities are all about putting customers first; the customers are the owners and they receive a dividend in the form of lower prices.
- Austin Energy is a public utility with 435 customers.
 - 2007 goal was 35% RE by 2020; expected to reach goal by 2016.
 - After engaging with customers and stakeholders, a new goal was set: 55% RE by 2025.
- Best opportunity for engagement is “moment of truth” leveraging: call-ins, receive bill, etc.
- Market EE first and foremost.
- The more we engage customers, the more satisfied they become.
- Benefits to utility from cross-promoting and cross-marketing.
- Learn marketing from successful businesses, irrespective of sector.

Summarized Q&A Session (Moderator, Holly Benz)

Q: Regarding grid defection: As battery storage costs fall, is this the tipping point and will customers stay on the grid when costs will only rise?

RS: We are at a tipping point but need to keep as many customers connected to the grid as we can for economies of scale. But battery storage is helpful and stabilizes the grid.

Q: What are the benefits for the customers and utility for staying on the grid?

DK: Reliable service anytime and benefits like restoring service within minutes of an outage that blacked out both the grid and off-grid sources. No one-size fits all, so case-by-case customer solutions best.

Q: How can we get utilities to listen? How can we ensure we get the choices on offer?

RS: In past years it was difficult, but last year's Energy Conference marked the beginning of real change. Utilities are listening and their efforts are directed at executing those things they know they need to do. Group-scale voices are more effective than individuals at getting attention.

Q: What led Austin Energy to focus on customer-led activities?

DK: Engagement mostly by email, social media, blogs, tweets, rallies, host forums, and customer surveys, replacing mail. There are 70 Citizen Commissions that allow customers to engage on topics of interest. We listen carefully to what our customers, and really pay attention to what they do.

Q: Are there any other surveys similar to MEDB's MPower? If not, what form should active listening take?

DK: These days, we know a lot about our customers through census, income and housing data, and consumer preferences. We use volunteer samples of customers who use online message boards. We've given them a primer and explained terms and jargon. This process helped design more robust programs to meet customer and utility needs.

MO'K: Our company takes 400m. meter readings a year but it's difficult to determine what is most meaningful and valuable. Customers want more data about themselves put into their profile as they want to be catered to. Personalization is important and general interactions do not resonate.

Q: With rooftop PV, how can owners be motivated to be more energy efficient?

RS: We rely on vendors to help – but they're not incentivized to sell less PV. We work with customers on efficiency issues, but for many it's a low priority.

Q: What about energy efficiency for passive use of appliances just plugged in but not necessarily in use?

HB: An Excelsior startup is addressing this.

MO'K: This goes to the core of energy literacy and customer understanding of daytime "vampire load." Focus group priority actions are to turn off the lights rather than unplug outlets.

Q: Who does a great job of customer engagement, whether in the energy field or elsewhere?

DK: The Salt River Project in Arizona (former employer) is outstanding and has customer service "baked into" the corporate culture. Employee pay is linked and incentivized to customer service metrics.

RS: Opower does outstanding work for Hawaii Energy because they are good at outreach, mostly by mail. Honeywell and Blue Planet Foundation do good work especially on neighbor islands.

KW: Netflix are master at gathering data and applying it. We look at their algorithms and what they do.

Q: How can expanded customer choice be good for utilities?

RS: Utilities have to re-generate themselves and generate new business. They should enter new segments such as transportation and lead initiatives.

Final Thoughts: What is the single most important change that has to occur to ensure customer engagement?

DK: Develop products and services that customers value. Communicate in terms customers understand through media they use. Listen to customers and pay attention to what they do.

RS: Install smart meter infrastructure with variable real-time rates based on the customers' benefit or burden to the grid. The rest will take care of itself.

KW: Transformation requires integrators; e.g. Solar Grid Storage (Colorado) and Tesla batteries.

MO'K: Personalization through using "big data." Use it for effective engagement and to get customers to think about their energy use.



Panelists (from left to right): Matt O'Keefe, Kimberly Williams, Ray Starling, Deborah Kimberly, Holly Benz

SESSION 7: THE CHANGING REGULATORY COMPACT – THE CUSTOMER, THE UTILITY, THE REGULATOR

How are utilities focusing on more than the typical utility operations to sustain and grow as a viable business entity? What does the future business model for the utility look like and how does the customer fit in? Are changes in the regulatory environment a necessity and what role does the investment community play in the utilities' viability?

Lorraine Akiba, Commissioner, Hawaii Public Utilities Commission (PUC)

- The 4 “R’s” are at the forefront of what will happen in the next phase: *Renewable* energy on a *reliable* grid in a *realistic* time frame, at *reasonable* rates.
- To achieve this, there needs to be a transformation of both the Regulatory Compact (RC) and how utilities do business – including engagement of customers.
- Two main takeaways:
 - The utility of the future provides customers with energy services, choice, and empowerment
 - Customers are active partners in transformation and stay engaged, connected to the grid
- The PUC has issued seminal orders that set the tone and issued a White Paper, “The Inclinations of Future Utilities for Hawaii” that outlined a strategic roadmap for utility transformation:
 - White Paper provides the vision and strategic road map to guide our utilities in terms of aligning utility business models with customer expectations and State energy policy. It provides specific guidance for future energy planning and review including strategic direction for capital investments for the integrated grid of the future
 - PUC incorporated recommendations of stakeholders (Reliability Standards Working Group) for integrating both utility-scale and RE resources into a reliable and cost-effective grid
 - White Paper gives specific directions for lower energy costs, improved system reliability, and addressing emerging challenges to integrating additional RE onto the grid
- PUC also issued an order to set power statement regarding DR programs.
- Energy efficiency and DR programs like JumpSMARTMaui can be an active component of DR to provide support to the grid and integrate more RE in the future.
- PUC gave specific guidance to utilities regarding goals and objectives of DR programs so distributed energy resources can be used by utilities as generation resources:
 - PUC specifically stated that EE, DR and energy storage are all generation resources and to be planned for in the transformation of the grid and to make customers active partners.

Kyle Datta, General Partner, Ulupono Initiative

- Consensus that we're standing at a crossroads of future and past, unsure of which way to go.
 - Choices: Stay with the existing model we know and leave the regulatory structure largely as is, decarbonizing our energy mix
 - Or change the model and embrace technological choices customers are making and realign the energy compact to the new reality
- In deciding where we go, we have to understand the historical context of how we got here:
 - Foundation for utility regulation is "Principles of Utility Regulation," by James Bonbright, published in 1961. Four key principles:
 - Keep utility viable to provide safe and reliable power
 - Fair apportionment of cost of service
 - Promote energy efficiency
 - Understandable for public and feasible to applyThese principles were not meant to *guarantee* returns to utilities, but the opportunity to earn a return. Rates are meant to be non-discriminatory, not necessarily perfectly fair.
 - 1978-2005: Federal government intervened and enacted a series of laws to create wholesale competition: PURPA (1978) and EPACT (1992).
 - EPACT of 2005 mandated alignment of utility regulation with Federal and state energy policy and promoted innovation, especially for RE. Required all state PUCs to look at Federal net metering approach; 43 states adopted it, leading to current scenario.
- Since 2010, there has been a fundamental technological shift that has made DG more comprehensive and empowering to customers than ever.
- The technological shift requires fundamental changes in the utility/customer relationship that calls for an additional regulatory principle: Utilities must compensate customers for the net value they provide to the system and require them to pay for the services used from the system.
- RC has co-evolved with the utility business model; changed over last 50 years:
 - Since 2006, Compact (RC) based on vertically integrated model with expectation of constrained growth, with emphasis on RE and EE.
 - Based on merger documents, HECO and NextEra seek to keep this model and RC, but eliminate NEM; but should not be able to cherry-pick.
- Policy should be directed at changing incentives so utilities can profit from providing the services customers say they need rather than using assets customers no longer want -- while preserving utility viability during the transition.
- Trust is a major issue; in short supply, and must be earned, not bought. Need for open conversations about decoupling, PSIP, DG, and planned merger to reach a consensus.

Raya Salter, Senior Utility Advocate, Natural Resources Defense Council

- Hawaii is leading in utility transformation but New York is also in the vanguard through its REV program, Reforming the Energy Vision:
 - Initiated by the NY Public Services Commission (PSC), endorsed by Governor and Legislative Chair of Energy and Finance
 - REV goals to create an independent distribution system platform provider to enable clean DE; and capture system-wide efficiencies for clean DE
 - Motivation for REV: lower cost of PV, increased grid capacity for PV and RE, high electricity rates (2nd only to Hawaii), aging infrastructure, system fragility shown by Superstorm Sandy
 - Inspired by UK RIO regulatory model: incentivizing utilities to meet public policy goals
- Revision of RC rule to a principle: Government to be bound to the public interest rather than RC:
 - Regulators will shift focus to oversight of competition and service quality, and more on financial oversight rather than business decisions
 - Increased oversight of vulnerable customers
 - Overall “thinner” regulation
- Customers will become more invested in the energy system and more independent from it:
 - Demand will be considered a resource
 - Customers will demand more services



Raya Salter

Jim Alberts, Senior Vice President, Customer Service, HECO

- Agree that utilities are in the process of transforming and becoming energy service providers.
 - Aligns with customer expectations: more interested in buying services than kWh
 - In this model customers are at the center and utilities must address needs and engage
- Transformation issues that customers care about include EE, DR, financing options, EVs, storage, DG, pricing, community solar, energy information, transparency, reliability and resilience.
- Utility role is to provide choices, options and solutions and help explain the trade-offs.
- Complicating issue: Variables – markets, technologies, customer expectations, public policy – out of alignment.
- Need incentives that align long-term interests with best-cost financing.
- Need tolerance for differential pricing (e.g. time of use); one size does not fit all.
- Need to evolve a new model without causing total disruption to a fundamental service.
- Current transformation issues and initiatives for HECO:
 - DE resources
 - Power supply (traditional and RE)
 - LNG
 - Grid modernization
 - New products and services
 - Revised market and regulatory models
- Importance of avoiding unintended consequences while maintaining social responsibility of providing essential services in fair and sustainable manner.

Summarized Q&A Session (Moderator: Joe Viola, Vice President, Regulatory Affairs, HECO)

Q: Does the PUC have a plan for electrifying transportation?

LA: PUC does not regulate transportation except for motor carriers. The PUC's White Paper does refer to the issue, advocating for enabling customer-side DE resources to support the grid, such as EVs.

RS: In New York, the NRDC has advocated for utilities to be directed to make plans for transportation.

LA: EVs are a whole new business opportunity for utilities and Hawaii is an ideal test bed.

Q: How best to align ratepayer and shareholder interests?

KD: Typically, utility shareholders are Pension Funds looking for investment certainty. Therefore alignment must take revenue certainty into account to attract capital. Ratepayers must feel the package offered provides the services they want at a good price.

JA: Sure, there's common ground: More RE, lower bills, and competition. Creating an alignment of all stakeholders is critical for success.

Q: How will regulators' oversight of utilities change in the future, if at all?

RS: In New York, the PSC is likely to focus on oversight of competition and less on financial and business aspects. We can expect updated and new codes of conduct.

JA: Regulation is one aspect; market design is another side.

Q: What are the most significant challenges for customers during the transformation?

LA: The PUC is aware that not all customers are alike. We must be aware of hard-to-reach customers and those that cannot take advantage of DE resources.

KD: A strength of Hawaii is its sense of community and initiatives such as community solar will harness that strength to ensure more equal distribution of resources. Large prosumers such as Parker Ranch and the military can form their own grids and provide complementary resilience.



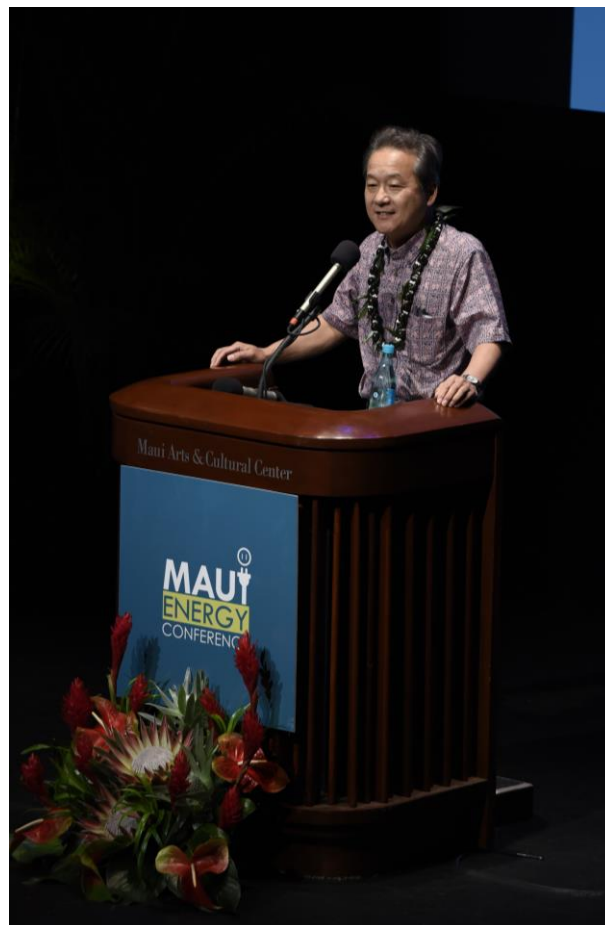
Panelists (from left to right): Jim Alberts, Raya Salter, Kyle Datta, Lorraine Akiba, Joe Viola

KEYNOTE: SOCIAL INNOVATION – OUR VISION FOR THE CUSTOMER

Yasuo Tanabe, Vice President & Executive Officer, Government and External Relations, Hitachi Ltd.

- Hitachi is lead partner in JumpSMARTMaui, in a consortium funded by the Japanese government agency, NEDO (New Energy and Industrial Technology Development Organization).
- Hitachi is a widely diversified conglomerate involved worldwide in a number of sectors:
 - Information and Technology systems (18%)
 - Social Infrastructure and Industrial Systems (14%)
 - High-Functional Materials and Components (13%)
 - Logistics and other services (13%)
 - Electronic Systems and Equipment (10%)
 - Automotive Systems (8%)
 - Smart/Eco-Friendly Systems (7%)
 - Power Systems (7%)
 - Home Appliances (7%)
 - Financial Services (3%)
- Hitachi's business is equivalent in scope to a combination of GE and IBM.
- An important aspect of Hitachi's business is its commitment to Social Innovation, especially advanced technologies integrated into social infrastructure involving energy, transportation, energy, health, water, etc. Some applications of Hitachi's Social Innovation businesses include:
 - Energy. In addition to JumpSMARTMaui:
 - Development of EV network serving as energy storage systems for homes or grid (Smart Cities energy project).
 - Involvement in micro-distribution management systems.
 - Area Manager Provider for Smart Micro-grid project, Kashiwa-no-ha, near Tokyo.
 - Grid Stabilization project in Bonneville, OR, in conjunction with the US Dept. of Energy.
 - Cryst-Ena system -- a grid stability high-speed response system using container-housed lithium-ion batteries combined with power conditioning system.
 - Behavioral analysis and simulation to improve design and energy consumption.
 - Transportation:
 - Rolling stock (especially high-speed rail), rail signaling and traffic management systems, station facilities, depot equipment systems, and power supply systems.
 - Contract with UK Intercity Express from 2017 to modernize the system.
 - Acquisition of Italian train-related company Ansaldo in 2015, involved in building the Honolulu light rail system.

- Traffic Control center providing “big data” to facilitate traffic operation management and city planning.
- Water Supply and Treatment:
 - Turbine pumps, infrastructure and equipment.
 - Water cycle simulation models for surface water and groundwater to facilitate development and planning.
 - Production of “Remix Water” – a combination of desalinated and treated reused wastewater for resource and energy conservation.
- Healthcare:
 - Equipment hardware (e.g. x-ray, particle beam accelerator therapy for cancer treatment).
 - Preventative and predictive “big data” analytics, including coverage for 300,000 Hitachi employees.
- Hitachi is committed to the solution of challenges faced by global societies through its Social Innovation businesses. Hitachi “thinks globally, acts locally.”
- Likewise, Hitachi is committed to Hawaii and Maui through demonstrating Hitachi’s capabilities.



Yasuo Tanabe

SESSION 8: CONSUMER PROTECTION: WHO'S LOOKING OUT FOR THE CUSTOMER?

What programs and regulations are in place to protect the customer in this new world of energy/customer choice? How will regulations evolve to address fairness concerns as some customers become energy producers and other continue to depend solely on the utility? What other regulatory challenges that impact the customer are on the horizon? What are the privacy concerns for consumers as the electric grid becomes more interactive? For example: smart meters and consumer privacy.

Panel Moderator Thomas Gorak, Chief Counsel, Public Utilities Commission, State of Hawaii

The PUC decides which path forward best serves the interests of the diverse customer base, and while businesses and large entities can represent themselves, this is less true for residential customers whose diversity make resolution of issues more challenging. Among these issues are:

- Balance: Between consumers who are power producers and those that are not, or cannot.
- Privacy: Amount of information needed to provide services that customers want.
- Input: How customers provide input to the PUC.
- Low-income customers: Ensuring equal access to the grid.

Jeffrey Ono, Executive Director, Division of Consumer Advocacy, DCCA, State of Hawaii

- Kauai Smart Meter pilot program:
 - Began in 2010, with 50% costs subsidized.
 - Of 37,000 customers, 2,698 (14%) opted out.
 - Most common opt-out reasons: health concerns (EMFs); privacy/security (TMI/hackable); billing issues (changes or increases).
 - Opt-outs charged \$50 plus \$10 pm (meter reading, etc.)
- NextEra/HECO merger. Benefits cited by NextEra can be categorized as follows:
 - Benefits confirming the status quo, e.g. Power Supply Improvement Plan; Distributed Generation Improvement Plan; Integrated Demand Response Program. Also status quo levels of corporate giving and same local governance. NextEra not offering any improvement on the status quo.
 - Benefits not yet quantified but quantifiable, e.g. improved access to lower-cost capital; other economies of scale.) These benefits should be quantified.
 - Benefits subject to contingencies, e.g. decoupling and rate base remain in place for 4-year rate case moratorium, reducing transparency. These should be minimized or eliminated.

- Quantified benefits not subject to contingency, e.g. set-asides for low-income customers; one-time ratepayer rebates; Contributions in Aid of Construction (CAIC) to keep capital projects out of rate base. These should be included.

Mark Toney, Executive Director, The Utility Reform Network

- Smart Meters represent a beneficial grid technology and a great value proposition for large or commercial customers. Offer immediate benefits for utilities and are lucrative and empowering.
- For residential customers, however, the benefits of smart meters always seem to be in the future, and economic benefits nonexistent: “the poverty of smart meters.” Time-based rates, pre-paid service and remote shutoffs all pose threats to consumers, especially the most at-risk.
- Commonly cited health risks associated with smart meters (EMF or RF emissions) are unfounded.
- Remote shut-offs via smart meters pose health risks due to naked flame fires and carbon monoxide poisoning from kerosene and other heaters. They also reduce customer leverage because utilities now use as a first resort, not last; PG&E shut-off rate increased 69% once done remotely (98% of meters in their service area in California are smart.) Adverse policy for customer relations.
- Voluntary, opt-in Time of Use pricing preferable to default Time of Use pricing currently under consideration by the California PUC. There are more effective and fairer ways to manage energy load such as demand response programs that depend on automation rather than human behavior.

John Howat, Senior Policy Analyst, National Consumer Law Center (NCLC)

- NCLC focus is cash-strapped consumers (those whose income is insufficient to make ends meet) and how they are impacted by rapid changes in the utility sector.
- With the changing business model and regulatory paradigm, it is important to not unravel important system components that should be retained such as net metering and compensation to encourage distributed generation.
- Importance of retaining oversight for basic distribution service that includes affordable, time-static rate options.
- Importance of reviewing and revising policy that exacerbates inequities or regressivity, such as loading costs into fixed customer charges.
- Importance of ensuring energy security in lower-income households through affordable payments (payment assistance/arrears management); energy efficiency through whole-house retrofits and zero financing; and regulatory protections through shutoff prevention, payment agreements, and secure notification of disconnection by mail.

Michael Jung, Policy Director, Silver Spring Network

- Utilities have an obligation to serve its customers. The best way to protect consumers is to engage, interact, and empower.
- Smart grid technology means that the grid no longer has to be a monopoly and one-way flow, or one-size-fits-all for products and services that unfairly impact low-income customers. Customers have different preferences and needs.
- Consumer protection is important for low-income customers, but the future holds a wide variety of products and services, different options for selling to, and storing from, the grid and for pricing structures. Two-way energy flows means the model is no longer about buying electrons.
- Every customer must have full access to a wide variety of services and products as well as access to a smarter grid.
- Currently, low-income customers are subsidizing affluent, high-use customers in many ways. The former's flatter load profiles are subsidizing the latter's peak load profiles.
- The development of enabling technologies that automate a two-way flow of energy and foster innovation reduces market volatility and facilitates a dynamic market.



Panelists (from left to right): Thomas Gorak, Jeffrey Ono, Mark Toney, John Howat, Michael Jung

KEYNOTE: ENGAGING CUSTOMERS IN A FRESH, NEW WAY

Deborah Kimberly, Vice President, Customer Energy Solutions, Austin Energy

- Austin Energy (AE) is the 8th largest public power utility in the US with 435,000 customers and revenue of \$1.5bn. p.a.
- AE governing board is the Austin City Council.
- AE mission is to deliver Clean, Affordable, Reliable Energy (“CARE”) with excellent customer service; customers and stakeholders are very engaged.
- AE goal for 2025 is 55% RE (currently, in 2015: 25%). Of the 2025 goal, 900mW will be derived from Energy Efficiency (EE) and Demand Response (DR); 950mW from solar energy. A further goal is for City facilities, operations and vehicle fleets to be 100% carbon neutral by 2025.
- A recent RFP for 150mW of utility-scale solar locked in a rate less than 5c per kWh for 25 years, sourced from West Texas, illustrating that solar prices are continuing to fall.
- 20th century model: increase sales, build and spend, enhance reliability. Compares with 21st century model: increased value to customers, expand products and services, customer experience beyond reliability and usual customer service.
- Changing demographics of utility customers: connected since birth, device owners, technologically adept, ethnically diverse, open to change: Which all affect modes of communication.
- There are so many channels of communication in the energy business that we can use now to engage with customers; e.g. EE and DR programs.
- AE promotes a Smart Utility Vision that goes beyond smart grid projects:
 - Improve customer engagement
 - Enhance safety and reliability
 - Improve workforce efficiency and productivity
- AE residential customer programs are interrelated and include:
 - Bring Your Own Thermostat:
 - Voluntary program launched in 2001 providing free programmable thermostats but limited by one-way communication and lacking connectivity. Program upgrade in 2013 provided internet enabled thermostats with customer incentive rebates, vendor incentives and range of customer choice.
 - Power Saver Volunteers: Series of “Energy Saver Tips” communicated by newsletters, email, event marketing, web links, and surveys.

- Web App Tier Alerts: Notifications of higher rates when usage approaches limits. Program includes EE tracking measures and energy reduction tips.
- Utilities need to become more customer-centric:
 - Not just about technology, smart grids or program design.
 - Need to develop products and services that customers value.
 - Willing to take risks.
 - Listen to what customers say but pay attention to what they do.
 - Communicate in terms customers understand by means of media customers actually use.



Deborah Kimberly

CLOSING REMARKS: KEY TAKEAWAYS – WHERE DO WE GO FROM HERE?

Constance Lau, Chairman and CEO, Hawaiian Electric Industries, Inc.

- As Henry Curtis remarked, Maui *is* Energy Central.
- Many speakers have recognized that we are all aligned in our goal of a cleaner energy future. Hawaii has a unique opportunity to transform the entire energy ecosystem.
- Hawaii is on the cutting edge of energy transformation and already leading in solar integration; continuing collaboration (e.g. between HECO and Solar City, NREL, and the Electric Power Research Institute to remotely re-program 600,000 inverters to improve grid resiliency) is vital.
- Continuing progress will next involve storage as cost falls, following the trend for PV. Storage will enhance grid stability, load shifting and optimization of RE resources.
- Hawaii's technological Excelsior is a key to addressing real-time issues and should be supported; it represents the best opportunity to transform Hawaii's energy industry into an energy sector with relevance beyond Hawaii.
- Provider DR initiatives need to be supported by regulatory frameworks that allow utilities to properly compensate those providers.
- The combined resources of DG, storage, and DR will put Hawaii on the cutting edge and make 100% RE a real possibility.
- Incentives similar to PV solar for storage and DR should be supported.
- Grid-scale renewable resources to match our world-class resources should also be encouraged.
- Important that communities are consulted for input to the decision-making process.
- HECO will pursue LNG as a bridge fuel and it is incumbent on us to diversify our liquid fuel source away from a price-volatile commodity to reduce customer exposure to risk.
- There are opportunities for greater change:
 - "green" transportation energy which accounts for two-thirds of imported oil:
 - EVs
 - Oahu electrified light rail
 - Port and airport infrastructure upgrades
- Engaging the next generation is vital.



Constance Lau

- Regarding the NextEra merger, it is exciting to partner with such significant resources and share a commitment for a vision of clean energy as we move towards aggressive, cutting-edge goals.
- It is incumbent on all of us to engage and provide the energy solutions for the future.

APPENDIX: BIBLIOGRAPHY OF CONFERENCE SPEAKERS

(Alphabetical Order)



Lorraine Akiba, Commissioner, Hawaii Public Utilities Commission

Lorraine Akiba was appointed to the Hawaii Public Utilities Commission in January 2012. She worked previously in private practice as a law partner at McCorriston Miller Mukai MacKinnon LLP and Cades Schutte Flemming & Wright LLP. She headed the Environmental Practice Groups at both law firms with an emphasis in environmental and natural resources law. She previously served as the Director of the State of Hawaii Department of Labor and Industrial Relations and as Chair of the State of Hawaii Environmental Council. Akiba is currently a member of the Advisory Council to the Board of Directors of the Electric Power Research Institute and has held leadership positions at a number of professional organizations. She is also a member of the National Association of Regulatory Utility Commissioners and serves on its Energy Resources and Environment Committee.



Jim Alberts, Senior Vice President, Hawaiian Electric

Jim Alberts joined Hawaiian Electric in 2012 as the Senior Vice President of Customer Service, following more than 20 years of utility experience at KCP&L and Aquila. During his career, Alberts has led teams and designed and implemented programs that focused on establishing top quality customer service and efficiency. While at KCP&L and Aquila as the Vice President of Customer Service, he was responsible for all customer contact channels, customer relations, quality assurance, e-services, billing, accounts receivable management, field services and meter reading. While at Aquila, he was a Lean Six Sigma Deployment Champion and certified Black Belt leading improvement teams across the Company. He serves as a Board member of Hospice Hawaii, a non-profit organization dedicated to bring hope, reduce fears and impact lives in end-of-life care.



Holly (Troy) Benz, Vice President, Consulting Schneider Electric North America

Benz joined Schneider Electric in 2010 and is leading the build out of a U.S. Consulting business for Schneider Electric – currently focused on the utility sector. Previously, she led the U.S. efforts in strategy, business development and marketing communications team for Schneider Electric. Prior to joining Schneider, Benz worked at Centrica Plc where she served as VP, Business Development for Direct Energy Home & Business Services in North America, Head of Residential Markets for British Gas New Energy (BGNE) and Head of Strategy for British Gas in the U.K. In the U.K. roles, Benz led efforts to bring low carbon products, services and educational programs to British Gas' 12 million residential customers and ran strategy for the \$16B U.K. residential energy and services business units.



David Bissell, President and CEO, Kauai Island Utility Cooperative

David Bissell is the President and CEO of Kauai Island Utility Cooperative (KIUC), having joined the Cooperative as chief financial officer in August 2006 and becoming KIUC's acting chief executive in June 2010. He brings more than 20 years of financial and electric utility management experience to KIUC. Before joining the Cooperative, Bissell served as manager of financial forecasting and reporting for Cinergy Corp (now part of Duke Energy). He began his career in the utility industry at Hoosier Energy Rural Electric Cooperative in Bloomington, Ind., where he spent six years as a tax and audit manager. Bissell was named the 2013 Utility CEO of the Year by the Solar Electric Power Association in recognition of KIUC's integration of solar electric power into its renewable energy portfolio.



Irene Bowie, Director, Maui Tomorrow

Irene Bowie is a 37-year resident of Maui. She served as Vice President of the Maui chapter of the American Cetacean Society in the late 1970's and was a founding member, in 1980, of Pacific Whale Foundation. Bowie has worked with a number of environmental organizations in Hawaii over the years and joined Maui Tomorrow Foundation as executive director in early 2007, also serving on the Maui Nui Marine Resource Council. She received Sierra Club Maui's 2012 Onipa'a Award for environmental activism and was named Maui Time's Best Political Activist for 2012 and 2013.



Henry Curtis, Executive Director, Life of the Land

Henry Curtis is an environmentalist, social justice advocate, community organizer, researcher, videographer, director, producer, peer reviewer, and community facilitator. Since 1995 Curtis has served as the Executive Director of Life of the Land, Hawaii's own environmental and community action group advocating for the people, the culture, and the 'aina since 1970. He views the path forward as requiring a true analysis of varied alternatives, examining life cycles, externalities and holistic links between varied fields. He is also with ililani media and Ka Kei Maile Ali'i Hawaiian Civic Club.



Kyle Datta, General Partner, Ulupono Initiative

Kyle Datta is a founding partner of Ulupono Initiative, which was formed in 2009 to invest in three key areas to make Hawaii more sustainable: more locally produced food, renewable energy, and waste reduction. Previously, Datta was the CEO of US Biodiesel Group, a national biodiesel firm; Managing Director of Research and Consulting at the Rocky Mountain Institute; and a Vice-President at Booz Allen Hamilton where he served as managing partner of the firm's Asia energy practice and head of the US utilities practice. He is co-author of the Rocky Mountain Institute books "Winning the Oil End Game" and "Small is Profitable." Datta serves on the board of directors for Blue Planet Foundation, Hawaii BioEnergy, and Parker Ranch.



Frank De Rego Jr., Director of Business Development Projects, Maui Economic Development Board, Inc. (MEDB)

Frank De Rego has over 30 years of experience in education and the nonprofit sector. Prior to joining MEDB, he developed curricula, trained and coordinated graduate engineering teaching assistants, and, for a time, was national coordinator at Purdue University for a program called Engineering Projects in Community Service. At MEDB, De Rego has provided leadership in the development of the Maui County Model for Energy and Water in collaboration with the Millennium Institute. He earned a bachelor's degree from the University of San Francisco with a double major in Philosophy and Religious Studies; a Master's Degree in Religious Studies from Katholieke Universiteit Leuven in Leuven, Belgium; and a Master's of Science Degree in Sociology from Purdue University, West Lafayette, Indiana.



Mark Duda, President, Hawaii PV Coalition

Mark Duda is a leading member of Hawaii's energy business and policymaking community. In 2009 he co-founded two of Hawaii's largest solar contracting firms, Distributed Energy Partners and RevoluSun LLC, which together have designed and built more than 50 MW of PV in the state. Duda is also President of the Hawaii PV Coalition and was President of the Hawaii Solar Energy Association from 2008 to 2012. In these roles he is active in both legislative and regulatory policymaking on a wide variety of energy issues. Duda also served in appointed positions on statewide bodies including the Hawaii Economic Development Task Force and the Hawaii DLIR's Steering Committee for Renewable Energy Workforce Development. He has been recognized as the Hawaii Venture Capital Association's Cleantech Entrepreneur of the Year, and received the Governor of the State of Hawaii's Innovation Award.



John Farrell, Director of Democratic Energy, Institute for Local Self-Reliance

John Farrell is the Director of Democratic Energy at the Institute for Local Self-Reliance and widely known as the guru of distributed energy. Farrell is best known for his vivid illustrations of the economic and environmental benefits of local ownership of decentralized renewable energy. His work appears most regularly on Energy Self-Reliant States, a blog with analysis of current energy discussions and policy. The posts translate complex economics of energy into tools for advancing local energy ownership. They are regularly syndicated at Grist, CleanTechnica, and Renewable Energy World.



Carl Freedman, Owner & Principal, Haiku Design and Analysis

Carl Freedman is the owner and principal of Haiku Design and Analysis, a Maui-based consulting firm specializing in Public Utility Regulatory Affairs. He has worked on matters before the Hawaii PUC for over twenty years representing a spectrum of clients. He served as the "Independent Entity" for the Integrated Resource Planning process of the HECO, MECO and HELCO companies and currently serves as a consultant to the Hawaii PUC. Freedman has developed several water and electric utility system simulation and analysis programs and has prepared integrated resource plans for several public and private water systems in Hawaii. He currently serves on the Steering Committee and chairs the Regulatory Reform Working Group of the Hawaii Energy Policy Forum.



S. David Freeman, American Engineer, Attorney, and Author

David is an engineer, attorney, author, utility manager, and eco-pioneer. He helped create the Environmental Protection Agency (EPA), and was appointed by President Jimmy Carter to head the Tennessee Valley Authority (TVA). David managed the electric system in Sacramento, CA, led the New York Power Authority, served as general manager of the Los Angeles Department of Water and Power, and was L.A.'s Deputy Mayor for Energy and the Environment. He has written two books: *Energy: A new era* (1975) and *Winning Our Energy*

Independence (2007).



Ken Geisler, Vice President of Strategy, Siemens Smart Grid, North America

Ken Geisler has over 30 years of management and technical experience in defining, designing, developing, and implementing large integrated solutions in the energy industry; he has served in various technical, management and executive roles for large international engineering companies. Most recently, Geisler served as chief architect, Smart Grid, Siemens Energy & Automation, responsible for solution vision, direction, strategy, definition, design, and initial implementations for all areas of EA business, including Smart Grid solutions related to transmission control

centers; distribution control centers, distributed energy resources, substation intelligence and automation; distribution automation, demand side management and response; and the overall integrated solution. Previously, Geisler was President, CEO and chairman of the board of Configured Energ Systems Inc.



Dan Girard, P.E. Director, Renewable Energy and Energy Storage Business Development, S&C Electric Company

Dan Girard has over 25 years of technical and project management experience working with utilities, large commercial and industrial customers on various engineering solutions. These have included electric utilities, commercial plants, industrial plants, college campuses, hospitals, wastewater plants, and water treatment facilities. He previously led major projects for S&C's Power Systems Services, including extensive experience in complex engineer-procure-construct

(EPC) solutions. Girard's additional experience includes 15 years as a Senior Area Engineer for Wisconsin Electric, where he evaluated and resolved all engineering problems in customer owned substations, utility owned substations, utility owned distribution, and distribution automation and any/all aspects of various applications.



Tad Glauthier, Vice President, Stem

As Vice President of Hawaii Operations, Tad Glauthier leads Stem's customer and utility-facing market activities in Hawaii including commercial customer engagement, utility engagement, and regulatory affairs. Prior to joining Stem, he worked at the Boston Consulting Group, where he specialized in growth strategies for Fortune 500 companies in energy and technology. Glauthier graduated Phi Beta Kappa with a Bachelor's Degree in English from Stanford University and received his Masters of Business Administration from the Stanford Graduate

School of Business.



Eric S. Gleason, President, NextEra Energy Transmission, LLC

Eric S. Gleason is president of NextEra Energy Transmission, LLC, an indirect wholly owned subsidiary of NextEra Energy, Inc. He joined the company in February 2011 after serving as vice president, corporate development and quality at Allegheny Energy, Inc. In this role, his responsibilities encompassed key aspects of corporate strategy, finance, operations, and commercial activities. As a member of Allegheny's Executive Council and head of the strategic planning ; he also provided oversight and support to their transmission expansion business. Prior to Allegheny Energy, he worked as an investment banker at JPMorgan Chase & Co. and The Goldman Sachs Group, Inc., here he advised leading North American and European energy utilities and financial investors. He began his career in the U.S. Army as a military intelligence officer. Gleason received his MBA in 1994 from Harvard Business School.



Thomas C. Gorak, Chief Counsel, Public Utilities Commission, State of Hawaii

For the past 35 years, Thomas Gorak has specialized in matters pertaining to public utility regulation at both the federal and state levels. He gained national recognition for his expertise in matters concerning the ongoing restructuring of the utility industry, and how various federal and state initiatives impact customers served by the industry. He was co-counsel in two major federal court cases in 1985, the successful appeal of which led to the restructuring of federal regulation of the natural gas industry to permit consumers access to more competitively-priced natural gas supplies. Gorak has lectured extensively on the issues raised by the restructuring of utility services and published a number of articles concerning these issues. For seventeen years, he served as instructor for the National Association of Regulatory Utility Commissioners (NARUC). He has been a frequent speaker at a variety of programs sponsored by NARUC, the Department of Energy, the American Bar Association, and the Federal Energy Bar Association.



James "Jay" Griffin, Chief of Policy and Research, Hawaii Public Utilities Commission

Jay Griffin serves as Chief of Policy and Research for the Hawaii Public Utilities Commission; he is currently on a leave of absence from his post as assistant specialist for the Hawaii Natural Energy Institute. He has won numerous awards, written for various publications and made a host of presentations relating to energy and costs. Griffin has worked for the RAND Corporation as a policy analyst as well as a conservation organizer for the Sierra Club, Hawaii Chapter and as watershed inventory and assessment project manager for the Hanalei Heritage River Program. Griffin is a member of the Hawaii Clean Energy Initiative Electricity Working Group and a mentor for the Hawaii Renewable Energy Venture Energy Excellerator.



John G. Howat, Senior Policy Analyst, National Consumer Law Center

At the National Consumer Law Center over the past 15 years, John Howat has managed regulatory, legislative, and research projects across the country in support of low- and moderate-income consumers' access to affordable energy and utility services. He has represented public agencies and non-profit organizations in a range of capacities in 30 states and as an expert witness in proceedings before state utility regulatory commissions in a dozen states. Previously, he served as Research Director of the Massachusetts Joint Legislative Committee on Energy, Economist with the Electric Power Division of the Massachusetts Department of Public Utilities, and Director of the Association of Massachusetts Local Energy Officials.



Michael Jung, Policy Director, Silver Spring Networks

Michael Jung serves as Policy Director at Silver Spring Networks, a leading provider of networking equipment and smart grid services for utilities across the country and around the world. He was appointed by Oregon Governor John Kitzhaber as chairman of the state's ten year energy plan task force; is a founding board member of Smart Grid Oregon; and serves as an expert lecturer with the National Regulatory Research Institute and Portland State University. Prior to joining Silver Spring Networks, Jung served as an energy policy advisor to Ohio Governor Ted Strickland, where he was an architect of milestone energy legislation in 2008. He previously managed climate change policy at American Electric Power. Jung has served as a U.S. Fulbright Fellow and is a graduate of Yale College and the Harvard Kennedy School of Government.



Maurice Kaya, Program Director, Pacific International Center for High Technology Research (PICHTR)

Maurice Kaya has worked as a clean energy and environmental engineering consultant and as the energy administrator for the Hawaii Department of Business, Economic Development & Tourism (DBEDT). Kaya was formerly the head of the Hawaii State Energy Office. His vision for energy systems of the future emphasizes movement towards being carbon neutral, with systems sufficiently networked so that optimal balances between supply and demand are encouraged through levelized market signals, with benefits of clean energy systems accessible and affordable to all. Kaya strives to position Hawaii in leading the way to that future, recognizing the need to rapidly change entrenched systems that are designed around finite resources.



Deborah Kimberly, Vice President, Customer Energy Solutions, Austin Energy

Deborah Kimberly joined Austin Energy in January, 2013 as the Vice President of Customer Energy Solutions. Her organization is responsible for the utility's energy efficiency and demand response programs, solar program, green building and advanced transportation, market analytics, and the key accounts function. Kimberly has worked in the utility industry for over 30 years, and spent more than 22 years at Salt River Project in Arizona; most recently, she was SRP's Director of Customer Programs and Marketing. Kimberly serves on the EPRI Power Delivery Unit Sector Council, SPEER's (South Central Partnership for Energy Efficiency as a Resource) Board of Directors and Commission on Energy Efficiency, the Program Advisory Committee of the Consortium for Energy Efficiency and is an Executive Sponsor of the Austin Energy Pecan Street Working Group, and the Texas Fuel Independence Projects.



Kelly Takaya King, Vice President and Chief Communications Officer, Pacific Biodiesel Technologies; Co-founder and Chair, Sustainable Biodiesel Alliance

Kelly King co-founded the renewable energy company Pacific Biodiesel Technologies, LLC with her husband Robert King in 1996. Recognized as an industry pioneer, Pacific Biodiesel was created to alleviate the disposal of waste cooking oil at Maui's landfill and became the first commercial biodiesel company in the U.S. As director of Marketing & Communications, King has helped sell and/or develop 13 biodiesel plants built by Pacific Biodiesel in the U.S. and Japan, and the company's community-based biodiesel model has become a standard for the sustainable renewable fuel industry. In 2006, she co-founded the Sustainable Biodiesel Alliance, a national non-profit organization. In Hawaii, she has been active as a board member on many local non-profits and currently serves as a board member of Hawaii Renewable Energy Alliance, Hawaii Energy Policy Forum, and UHMC Sustainable Sciences Management Advisory Council.



Jonathan Koehn, Regional Sustainability Coordinator, City of Boulder

Jonathan Koehn is the Regional Sustainability Coordinator for the City of Boulder, Colorado, where he oversees the city's sustainability agenda, specifically in relation to climate action and waste reduction, but more broadly across the complete spectrum of the city's sustainability goals. Most recently, Koehn was the Environmental Affairs Manager for the city. He came to Boulder with more than 10 years of experience working with state, regional, and local governments and its constituencies domestically and internationally to develop strategic and tactical solutions to energy, economic and climate challenges. Since 2009, Koehn has been focused on the various aspects of Boulder's energy efforts, and primarily, the city's municipalization exploration project.



Neil "Dutch" Kuyper, Chief Executive Officer, Parker Ranch Inc. (PRI)

Dutch Kuyper has served as President and CEO of Parker Ranch, one of Hawaii's largest landowners, since 2011. In this role, he has acknowledged the value of diversity and sustainability, especially in the field of renewable energy. Before returning to his home state, the Punahou graduate spent 20 years in increasingly senior executive positions on the mainland and in Asia. Among his appointments, Kuyper served most recently as Chief Operating Officer with Capricorn Investment Group, previously holding the same position with Morgan Creek Capital Management, following extensive experience with Wellington Management, Boston Consulting Group and Coopers & Lybrand.



Constance Lau, President and Chief Executive Officer, Hawaiian Electric Industries Inc.

Constance Lau has served as President and CEO of Hawaiian Electric Industries (HEI) since May 2006, and also serves as chairman of Hawaiian Electric Company (HECO) and chairman of American Savings Bank. Born and raised in Honolulu, she joined the HEI companies in 1984. Lau is a director with Matson, Inc., and since 2012 has chaired the National Infrastructure Advisory Council (NIAC) which advises President Obama on the security of critical infrastructure sectors, including energy, and is a member of the Electricity Subsector Coordinating Council, which interfaces with the federal government on behalf of the electric utility industry. She was named 2011 Woman of the Year by the Women's Council on Energy and the Environment in Washington, D.C., and serves on several energy-related boards. In August 2014 she was named as a C3E Clean Energy Ambassador by the U.S. Department of Energy.



L. Hunter Lovins, President, Natural Capitalism Solutions

Hunter Lovins is President of Natural Capitalism Solutions (NCS), a Colorado nonprofit that educates senior decision makers in the business case for a regenerative economy and advocates for more sustainable business practices. An international consultant, professor, speaker, and author, Lovins has briefed heads of state, the Pentagon, the United Nations and the U.S. Congress. A founding mentor of the Unreasonable Institute, she teaches entrepreneuring and coaches social enterprises around the world. Lovins is a founding partner in Principium, an impact investing firm. In her 30 years as an intellectual insurgent in sustainability, she has written hundreds of articles and 14 books, including her international best-seller, *Natural Capitalism*. Lovins is currently professor of Sustainable Business at Bainbridge Graduate Institute, University of Denver. She has won dozens of awards, including the 2012 the Rachel Carson Award. In 2013 she was inducted into the Hall of Fame of the International Society of Sustainability Professionals.



Justin McCurnin, Vice President and General Manager, Smart Grid Solutions, HBS ACS

Justin McCurnin is the VP GM of Smart Grid Solutions at Honeywell. In this role, Justin leads a product and service business called Honeywell Smart Grid Solutions (SGS) providing automated demand response technologies and communications. McCurnin joined Honeywell in 2003 and served in many roles including Global Channel Marketing Leader, Marketing Director U.K. and Sr. Product Manager Smart Phone Apps and Connectivity (ECC). Prior to joining Honeywell, McCurnin held management, strategy, business development, and marketing roles at large marketing and advertising agencies. He earned a Bachelor's Degree from Loras College and a Master's in Business Administration from Drake University.



Mathew McNeff, Manager, Engineering, Maui Electric Company, Ltd.

Mathew McNeff is currently the Manager of the Engineering Department at the Maui Electric Company. His primary responsibilities include the oversight of renewable energy, modernizing the grid, and providing reliable service to customers. Maui Electric Company owns and manages the power systems (including generation, transmission, and distribution) on the islands of Maui, Molokai, and Lanai. McNeff has been with the Maui Electric Company for 12 years and was previously the Manager for the Renewable Energy Services Department. Mathew is a licensed professional engineer in Hawaii and holds a B.S. degree in Civil Engineering from Rose-Hulman Institute of Technology and an M.S. in Engineering from University of California at Berkeley.



Jeff Mikulina, CEO, Blue Planet Foundation

Jeffrey Mikulina is the Chief Executive Officer of the Blue Planet Foundation, a nonprofit organization whose mission is to clear the path for clean energy in Hawaii. Through collaboration and advocacy, Blue Planet champions scalable policies and programs to transform Hawaii's energy systems to clean, renewable energy solutions. Prior to working with Blue Planet, Mikulina served as director of the Sierra Club, Hawaii Chapter for a decade. His interests include disruptive technology, policy, and impact of social norms on behavior. He received a Master's of Science Degree in engineering from the University of Illinois at Urbana-Champaign studying decision theory.



Cathy Nobriga Kim, Vice President, Maui Soda and Ice Works

Cathy Nobriga Kim was appointed to Vice President, Production Division of Roselani Ice Cream in 2003. She serves as the Corporate Treasurer on the Board of Directors for Maui Soda & Ice Works, Ltd. Nobriga Kim is currently a member of the Hale Makua Health Service Board and has also held leadership positions at a number of professional



Sebastian "Bash" Nola, Utility Consultant

Bash Nola is a renewable energy and utility consultant who brings more than 45 years of management experience in the energy industry to the conference. He spent 31 years of his career in key management positions at the Southern California Edison Company, the third largest investor owned electric utility in the nation. Nola managed and directed the activities of Edison's generation planning function and their renewable and alternative generation resource program. Today, he serves as an independent consultant to the wind and renewable energy industry and has been involved in the development of Hawaii's first wind generating facilities. Nola consults for Blue Planet Foundation and has participated in the State of Hawaii PUC's Reliability Standards Working Group and in HECO's Integrated Resource Planning Process as a PUC nominated Advisory Group member.



Matt O'Keefe, Director of Market Development and Regulatory Affairs, Opower

Matt O'Keefe serves as the Director, Market Development and Regulatory Affairs at Opower, where he manages regulatory and policy strategy throughout the American West and Western Canada. Prior to joining Opower, O'Keefe was at the California Energy Efficiency Industry Council, the Office of the Mayor of Los Angeles and with CleanTech LA where he worked with that state's leaders of energy efficiency businesses, investor-owned utilities, and relevant regulatory bodies. O'Keefe was recently appointed to the Board of Directors of the Canadian Energy Efficiency Alliance. He holds a Master of Public Policy from University of California, Los Angeles and a BA in International Affairs from The George Washington University.



Jeffrey Ono, Executive Director, Division of Consumer Advocacy, Department of Commerce and Consumers Affairs, State of Hawaii

Since January 2011, Jeff Ono has been the executive director of the Division of Consumer Advocacy, Department of Commerce and Consumer Affairs. As the executive director, Ono actively participates in matters that come before the Public Utilities Commission by setting policy for the Consumer Advocate's office, drafting statements of position, offering testimony to the PUC and the Hawaii legislature, and appearing as legal counsel for the Consumer Advocate's office before the PUC. As the Consumer Advocate, Ono also sits on the Enhanced 911 and One Call Center boards. He is an attorney licensed to practice law in the state of Hawaii. Prior to accepting the position as the Consumer Advocate, Jeff was in private practice with an emphasis on civil litigation. He is a graduate of the University of Wisconsin Law School and the University of Hawaii at Manoa.



Alan M. Oshima, President and CEO, Hawaiian Electric Company

Alan Oshima was named president and chief executive officer of the Hawaiian Electric Company, Inc. effective October 1, 2014. Oshima first joined Hawaiian Electric as a member of the board of directors in 2008. In 2011, he left the board to serve as HEI's executive vice president for corporate and community advancement and president of the HEI Charitable Foundation. In May 2014, he joined the Hawaiian Electric executive team full time. Prior to joining the Hawaiian Electric Board in 2008, Alan served as senior vice president, general counsel, and corporate secretary of Hawaiian Telcom. He also founded the law firm of Oshima Chun Fong & Chung and, prior to that, practiced law with Carlsmith Ball. Due to his significant experience with electric, telecommunications, and transportation companies, as well as water and sewer resources in Hawai'i, Oshima was consistently recognized as one of "America's Best Lawyers" in the field of public utilities.



Richard Rocheleau, Director, Hawaii Natural Energy Institute (HNEI)

Richard Rocheleau received his BChE and PhD in Chemical Engineering from the University of Delaware and a MS in Ocean Engineering from the University of Hawaii. Following his graduate work, Dr. Rocheleau led the reactor design group at the Institute of Energy Conversion, University of Delaware, developing new processes for the production of thin-film photovoltaics. He joined the faculty of the Hawaii Natural Energy Institute at the University of Hawaii at Manoa in 1988 and was appointed Director in 2000. As Director he has emphasized the formation of public-private partnerships for the development, testing, and evaluation of alternative energy technologies. Current efforts include finding solutions to the high penetration of grid-connected renewable generation technologies including smart grid technology and the development of alternative fuels. Dr. Rocheleau also serves as the PI for the University of Hawaii's Marine Renewable Energy Center focused on deployment and testing of grid-connected wave energy technology.



Will Rolston, Energy Coordinator, County of Hawaii

Will Rolston is the Energy Coordinator for the County of Hawaii and has 25 years of experience in the power generation field as both a power generation engineer and energy analyst. He started as a power engineer for Westinghouse and Siemens, specializing in renewable energy projects. Rolston also has experience as an energy analyst for the investment firm Janus Capital and other private equity firms. In Hawaii, he was Renewable Projects Administrator for the Natural Energy Laboratory of Hawaii before his appointment as County of Hawaii – Energy Coordinator.



Luis P. Salaveria, Director, Department of Business, Economic Development, and Tourism, State of Hawaii

Luis Salaveria has more than 20 years of experience in the public and private sector with a demonstrated record of achievement and success in both growth and turnaround environments. Before taking his current position at DBEDT, he was most recently the State of Hawaii's Deputy Director of Finance from 2011 to 2014, Department of Budget and Finance, where he was responsible for the planning, design, and management of the annual \$12 billion operational and \$3 billion capital improvement budgets. Over the preceding 10 years, he was Finance Manager at Kaiser Permanente Hawaii, providing financial and accounting oversight of Kaiser Permanente's National Facilities Services in Hawaii. His prior experience that included Senior Budget and Financial Analyst for the State of Hawaii Department of Defense, Director of Research for Monroe & Friedlander (Colliers International), and Budget Supervisor for the Senate Committee on Ways and Means.



Raya Salter, Senior Utility Advocate, Natural Resources Defense Council (NRDC)

Raya Salter is Senior Utility Advocate at the Natural Resources Defense Council (NRDC) where she focuses on the development of new utility business models. She also works to increase the deployment of clean and renewable energy in urban environments with a focus on the low income sector. Salter is representing NRDC and a low income energy efficiency coalition in the New York Public Service Commission “Reforming the Energy Vision” and related proceedings. She is also an adjunct professor at Fordham University School of Law. Previously, Salter was

a regulatory attorney for the Environmental Defense Fund, where she worked to engage utilities, regulators, policy makers, and opinion leaders to foster clean and renewable grid modernization. Prior to becoming an environmental advocate, Salter worked as a regulatory attorney at the law firm of Dewey & LeBoeuf in New York City on energy industry issues.



Jeanne Unemori Skog, President and Chief Executive Officer, Maui Economic Development Board, Inc. (MEDB)

Jeanne Unemori Skog has been affiliated with MEDB for more than 30 years. When she became the fourth President & CEO of MEDB, she brought considerable experience in fund and partnership development, project development and management, community relations, and conference planning. Skog spearheaded development of the High Tech Maui program focused on growing innovation sectors in Maui County, exemplifying MEDB’s commitment to spurring economic diversity. She also advanced MEDB’s history of convening

community around economic issues by initiating the groundbreaking Focus Maui Nui community visioning process in which 1,700 residents articulated key values, priorities, and strategies. To support the workforce needs of innovation, Ms. Skog launched the Women In Technology (WIT) program to prepare women, girls and other underrepresented minorities for emerging careers founded on science, technology, engineering and math (STEM).



H. Ray Starling, Program Director, Hawaii Energy

Ray Starling is Program Director for Hawaii Energy, the Public Benefits Fee program which administers Hawaii’s energy efficiency program under contract with the Hawaii Public Utilities Commission. His team designs and implements various education, incentive and financing programs that promote clean energy in Hawaii. Prior to this position, Starling managed an energy consulting firm which developed renewable energy projects in Hawaii, including the West Maui Makila Hydro-Electric Plant. Additionally, he served in legal and executive

positions at two electric utilities, including Hawaiian Electric Company. In 2009, Starling retired as a Major General in the Air Force Reserve after 37 years of service. He is the proud owner of a NET-ZERO home and a Nissan Leaf EV.



Yasuo Tanabe, Vice President and Executive Officer, Hitachi, Inc.

Mr. Yasuo Tanabe has held his current role since 2011 and has also served as a member of the Board of the International Energy Agency and as a government representative at the International Energy Forum, Asia-Pacific Economic Cooperation (APEC), and the Association of South East Asian Nations (ASEAN+3). Tanabe has also served as a negotiator with ASEAN and other countries. He joined Hitachi after five years as Deputy Director-General for the Economic Affairs Bureau in Japan's Ministry of Foreign Affairs and a term as Vice President at the Research Institute of Economy, Trade, and Industry. Tanabe also has extensive experience at Japan's Agency of Natural Resources and Energy (ANRE). He holds a Bachelor's Degree in Law from the University of Tokyo and a Master's Degree in International Relations from Stanford University.



Fern Tiger, President and Creative Director, Fern Tiger Associates

Fern Tiger is president and creative director of the Oakland, CA-based Fern Tiger Associates (FTA), and is a Professor in the Urban Studies Program at University of Washington, Tacoma. An artist by training with postgraduate work in cognitive psychology, Tiger combines the insights of a designer with the practical and systemic tools of planners and researchers. FTA integrates diverse disciplines to focus on the impact of public policies on communities and mission-driven organizations. The firm is known for its work with organizations, foundations, universities, and governments striving to increase civic engagement, improve the lives of low-income families and children, bolster public education, and support philanthropy. FTA, under Tiger's guidance, has won scores of awards for its innovative design, communications, and community planning strategies. Tiger is a frequent speaker at conferences dealing with both nonprofit and urban issues.



Mark Toney, Executive Director, The Utility Reform Network (TURN)

Mark Toney has served as executive director of TURN—The Utility Reform Network since 2008, promoting affordable green energy and phone service through legal advocacy, grassroots organizing, and policy campaigns. His leadership defeated an anti-consumer statewide initiative despite being outspent \$46 million to \$120,000, expanded LifeLine discounts to wireless phones, and included diverse communities in policy making. Toney has organized for social justice for 35 years, earned his Bachelor's Degree in political science from Brown University, his Ph.D. in sociology from UC Berkeley, and he has been recognized as a Kellogg National Leadership Fellow, National Science Foundation Fellow, and Echoing Green Fellow.



Joe Viola, Vice President of Regulatory Affairs, Hawaiian Electric Company

Joseph Viola has been the manager of the legal department at Hawaiian Electric Company since 2009. Viola has served in HECO's general council since 2000. Previously, he was an associate with Alston Hunt Floyd & Ing from 1994 to 2000. Joseph earned his Juris Doctor from Hastings College of the Law, University of California, in 1991.



Kimberly Williams, Co-Founder and Managing Director, Solar Fuels Institute (SOFI)

Kimberly Williams is the co-founder and Managing Director of Solar Fuels Institute (SOFI) and Visiting Scholar at Northwestern University. She is developing unique partnership structures and energy technology intellectual property of strategic value with an emphasis on integrated systems, financial management, growth, and risk analysis. Williams has managing partner experience in farming, oil and gas, entertainment, and banking enterprises.

Before retiring from the large private corporate sector, she served as Managing Director of a billion-dollar multiple investment fund with partners JE Robert, GE Capital, and Goldman Sachs, and as Head of JE Robert's Dallas Corporate Office. She holds a BS from the University of Kansas and attended the Executive Education Program at the Tuck School of Business.



Jon Yoshimura, Director, SolarCity

Jon Yoshimura is a director of policy and electricity markets, and regulatory counsel for SolarCity, a leading full-service solar provider for homeowners, businesses, and government. In addition to a robust residential and commercial portfolio, SolarCity developed one of Hawaii's biggest solar projects, a 14MW ground mount for Kauai Island Utility Cooperative (KIUC) which provides six percent of the Garden Isle's electricity needs. A former broadcast journalist and Honolulu city councilman, Jon also served as communications director for U.S.

Senator Daniel Akaka in Washington, D.C.



This report was prepared by Maui Economic Development Board (MEDB) and funded by the County of Maui Office of Economic Development (OED)

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