

# CCIF

*Critical Consumer Issues Forum*

## **DG: A Balanced Path Forward** Providing Customer Choice While Ensuring Reliability



July 2014



# Table of Contents

<b>SECTION I: INTRODUCTION .....</b>	<b>1</b>
About CCIF .....	1
Importance of CCIF .....	1
CCIF Track Record .....	1
CCIF's 2-Year Initiative on DG .....	2
<b>SECTION II: CONSENSUS FRAMEWORK &amp; PRINCIPLES ON DG .....</b>	<b>3</b>
Scope of CCIF Work on DG .....	3
Objective of CCIF Work on DG .....	3
Potential Benefits & Challenges of DG .....	4
Consensus Principles & Related Input on DG .....	5
<b>SECTION III: CONCLUSION .....</b>	<b>10</b>
Objective Met .....	10
Disclaimer .....	10
Acknowledgments .....	10
Future CCIF Initiatives .....	10
<b>APPENDIX .....</b>	<b>11</b>
Acknowledgment: 2014 Summit Participants .....	11
Acknowledgment: 2013 Summit Participants .....	14
Leadership .....	16
Executive Director .....	17
Events on DG .....	18
Kickoff Agenda .....	19
Sample Summit Agenda .....	20
Guest Stakeholder Summaries .....	23



# I. Introduction

## About CCIF

Formed in 2010, the Critical Consumer Issues Forum (CCIF) brings state commissioners, consumer advocates, and electric utility representatives together to tackle consumer-focused energy issues through interactive discourse and debate, to find consensus when possible, and at a minimum, to achieve a clearer understanding of—and appreciation for—each other’s perspectives and positions.

To provide leadership, CCIF organized Executive and Advisory Committees, each with balanced representation from the three core communities. The current members are recognized in the Appendix. These 12 leaders guide each initiative from topic selection to issuance of the final report.

The 3-step process by which CCIF develops its reports on relevant and timely energy topics entails:

1. A large open kickoff forum, typically collocated with the NARUC & NASUCA Annual Meetings, to introduce a topic and initiate discussion among CCIF’s three core communities and other stakeholders;
2. A series of smaller, invitation-only spring summits in which the three communities engage in facilitated dialogue; and
3. A report issued in the summer to share key takeaways with the broader stakeholder community and serve as a foundation for additional dialogue on numerous fronts.

## Importance of CCIF

Consumer issues are at the forefront of the energy policy debate. State commissioners, consumer advocates, and electric utilities are uniquely positioned to understand those issues and how best to mitigate any negative impacts on consumers. These three groups play an important role in influencing the policies and decisions with respect to energy at the state level, and these state policies and decisions are often drivers of broader energy policy. Therefore, it stands to reason that they take the lead on addressing key energy issues so that our policies benefit from their experience, expertise, and insights on consumer preferences and concerns. CCIF provides these three core groups a unique opportunity to take that lead—by providing a non-adversarial, collaborative environment in which they can candidly discuss and proactively address a variety of energy issues with potentially broad impacts on electric consumers.

## CCIF Track Record

The CCIF formula has proven successful, and its reports have contributed to the energy policy debate. Through this collaborative effort, CCIF has previously addressed topics including grid modernization, the regulatory process, and distributed energy resources. In 2011, CCIF released its first report, which contained 30 consensus principles on grid modernization. CCIF’s 2012 report explored whether and how transparency, communication, prioritization, and collaboration may be used to improve the regulatory process. The most recent report was released in 2013 and contained a consensus framework and 21 principles related to distributed energy resources. All three reports are available at [www.CCIForum.com](http://www.CCIForum.com).

## **CCIF's 2-Year Initiative on Distributed Generation**

In late 2012, CCIF leadership identified the challenging topic of distributed energy resources (DER) as ripe for discussion among the three core groups. Without question, state commissioners, consumer advocates, and electric utilities possess both individual and collective perspectives that should be considered as policies are formed in this area. Therefore, CCIF kicked off an initiative on DER in November 2012 with a program that examined our distributed future, the benefits and challenges of DER, and relevant public policy initiatives and regulatory actions. The forum provided a solid foundation for the summits that followed as well as the framework and principles that ultimately were developed by summit participants from the three communities and included in CCIF's 2013 report.

While recognizing that DER typically includes energy efficiency and demand response, 2013 summit participants from the three groups chose to narrow CCIF's focus to distributed generation (DG). This decision was reflected in the adopted definition of DER included in the 2013 final report.

In late 2013, CCIF leadership chose to continue CCIF's work on the topic of DG in a manner that would build upon the foundation of CCIF's 2013 consensus framework and principles. The November 2013 kickoff program examined lessons learned from DG public policy initiatives and regulatory actions, addressed potential future approaches to provide a balanced path forward, and dug deeper into a number of consumer protection and consumer education issues related to investment in DG.

Over the course of three summits that followed this spring, participants from the three core groups developed the additional principles on DG that are included in this report. Participants also chose to reflect related summit discussion in a few areas as noted within. Finally, please note that the principles and related context developed from both the 2013 and 2014 summit processes have been combined and reordered for a more complete and organized statement on DG.

As a compilation of participants' perspectives on critical issues pertaining to DG, this report demonstrates that these groups are clearly able and ready to lead both state and national debates on challenging energy issues—those pertaining to DG and countless others. CCIF trusts that the valuable perspectives reflected within these principles will be instrumental as we continue to build upon these ideas through further constructive dialogue with the broader stakeholder community.

## II. CCIF Consensus Framework & Principles on DG

### Scope of CCIF Work on DG

Distributed generation (DG) is a non-centralized source of electricity generation generally interconnected to the distribution system and located at or near customers' homes or businesses. Examples of DG addressed by this collaborative include solar panels, energy storage devices, fuel cells, micro-turbines, reciprocating engines, small wind, CHP systems, etc.

In CCIF's 2013 report, the term "distributed energy resources" and the abbreviation "DER" were used throughout the consensus framework and principles. However, the 2013 participants defined the term such that the principles effectively dealt with distributed generation, a subset of DER. Participants chose to use "distributed generation" or "DG" throughout the 2014 report and to more accurately reflect the intent of the 2013 report by changing the terminology to DG for those 2013 consensus items referenced herein.

For a more complete and organized statement on DG, the principles and related context developed from the 2013 and 2014 processes have been combined and reordered with the consent of the 2014 participants. While some of the 2013 participants were also part of the 2014 process, others did not participate and therefore should not be construed as having considered or provided consent for the additional 2014 principles and related input. Participants from both processes are separately recognized in the Appendix.

### Objective of CCIF Work on DG

During CCIF's 2014 summit series, state commissioners, consumer advocates, and electric utility representatives endeavored to build upon the foundation of CCIF's 2013 principles on DG. By digging deeper into these complex issues, developing additional consensus where possible, and elucidating policy and regulatory options, participants better equipped themselves—as well as policymakers and other stakeholders via this final report—to integrate DG technologies in a safe, fair, cost-effective, and reliable manner.

During CCIF's 2013 summit series, participants acknowledged that the role of DG is growing and may require new approaches for providing and regulating electricity services. We recognized the need for a better understanding of costs and benefits of DG. Our goal was to develop a framework to assist policymakers and other stakeholders in evaluating issues related to the potentials and challenges of DG in providing safe, reliable, affordable, cost-effective, and environmentally sound energy supply. In developing this framework, we recognized the differing regulatory and market structures (e.g., vertically integrated, wires-only utilities, etc.) of the states, as well as the potential significance of regional and federal requirements.

## Potential Benefits & Challenges of DG

Although the following list does not include all potential benefits and challenges pertaining to DG, it provides a useful starting point for further analysis.

When paired with appropriate public policies, DG has the potential to provide direct and indirect **benefits** to consumers, both individually and collectively. Depending on the type of DG, benefits that may be realized include:

1. Cost and risk reduction benefits;
2. Security and reliability;
3. Environmental benefits;
4. Innovation, expanded research and development, and other economic benefits; and
5. Expanded customer choice and control.

Likewise, the **challenges** associated with DG should be considered. Depending on the type of DG, such challenges may include:

1. Financial impacts on utilities and customers, including increased costs, revenue losses, and cost-shifting;
2. Safety, security, operational control, reliability, and planning;
3. Siting, permitting, and other environmental issues;
4. Maintaining consumer protection standards; and
5. Jurisdictional and regulatory issues.



## Consensus Principles & Related Input on DG

This section is divided into four main categories: Financial & Regulatory Issues; Market Development & Deployment Issues; Consumer Issues; and Safety, Reliability & System Planning Issues. Each category contains consensus principles, and some include related input based on summit discussion (but not necessarily group consensus). While consensus principles are consecutively numbered, the related input is set apart so as to distinguish it from the principles. In addition, consensus principles developed as a result of the 2014 summits are shown in purple text but are combined with the consensus principles from the 2013 process in order to provide a more complete and organized statement on DG issues.

### *Financial & Regulatory Issues*

1. Regulatory policies with respect to DG should balance the following objectives:
  - Facilitating opportunities for customers to choose DG options;
  - Minimizing customer bill impacts;
  - Protecting the interests of non-participating customers, including those least able to afford any increased costs;
  - Recognizing the appropriate benefits and costs of DG technologies;
  - Acknowledging federal and state energy, environmental, and economic policies; and
  - Recovering prudent costs of integrated grid services in rates.
2. To the extent that state commissions evaluate new regulatory policies and procedures in light of increased emphasis on DG, they should take into account the interests and concerns of all stakeholders.
3. Utility investments required to accomplish DG deployment should be consistent with state policies and recovered in a manner consistent with state laws and regulatory policies.
4. Policymakers, regulators, consumer advocates, utilities, DG owners and operators, and others should work collaboratively, and in formal proceedings as necessary, to assess various approaches to facilitate equitable and sustainable policies for DG integration and operation, respecting regional and state diversity.
5. To the extent state policymakers or regulators determine incentives<sup>1</sup> for DG are justified based on societal benefits, the costs of those incentives should be transparently distributed among all relevant consumers within that state.
6. Any incentives, through ratemaking practices, taxes, or otherwise, should be fair, transparent, and appropriate.
7. DG incentives should be based on clear policy objectives and periodically reevaluated based on market conditions. Once the underlying policy objectives are met or as the technologies become cost-competitive or cost-prohibitive, such incentives should be modified or discontinued.

<sup>1</sup> For purposes of this discussion, participants considered “incentives” as benefits received by or cost reductions to a DG project, such as tax subsidies, rebates, subsidized financing, any net metering arrangement that provides benefits exceeding the underlying value of the energy received from that DG, etc.

8. Generally, DG costs imposed on utilities should be borne by those who cause the costs. For example, backup or standby utility costs (particularly regarding intermittent DG technologies) should be borne by the operator of the DG.
9. Any required allocation of costs to others should be rational, transparent, based on benefits received, and not unduly burdensome.
10. While net metering is intended to be a relatively simple mechanism to provide an incentive for DG, it can over- or under-compensate DG customers depending on the underlying rate design. To ensure that net metering and other mechanisms to facilitate DG do not result in a misallocation of costs among customers or impose undue costs on utilities, regulators must ensure that rates reflect equitably the benefits and costs of DG.

### **Potential Regulatory Approaches (Rate Design & Other Regulatory Tools)**

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CCIF participants discussed a number of regulatory approaches to DG integration, but the group did not attempt to develop consensus around any one set of options. Below is an alphabetical list of some of the potential approaches.

- Buy All-Sell All: Utility provides services to DG customers at utility rates and purchases all DG output from DG customers at avoided cost or wholesale rates.
- Decoupling: Fixed cost recovery not linked to usage.
- Demand Charge: Charge that varies by amount of demand used by customers.
- Feed-In Tariffs: Utility pays DG customers a contracted amount for a specific type of generation.
- Fixed Customer Charge: Charge intended to recover fixed infrastructure costs that are not tied to volumetric usage.
- Minimum Monthly Billing: Regulatory-determined amount is chosen as a minimum bill amount which pays for an equivalent amount of usage. Customers must pay at least the minimum, regardless of usage.
- Net Metering: Customer pays for power based on meter reading which subtracts self-generation from customer usage.
- New Rate Group for DG Customers: Separate tariff for DG customers that reflects their usage characteristics.
- Three-Part Rates: Customer charge + demand or capacity charge + volumetric charge.
- Time-of-Use Pricing: Rate varying by time period allowing for potential cost savings by shifting usage off-peak; may require advanced metering technology.
- Two-Way Rates: Each party compensated for the services it offers the other.
- Value of Solar: Value of solar DG determined by valuation studies. Value can differ by type of DG.

## *Market Development & Deployment Issues*

11. While policies and their application may vary by state, DG programs, grants, or subsidies should be periodically evaluated for cost-effectiveness and adjusted by the appropriate regulatory authority as market conditions and policy objectives or requirements change.
12. Utility and regulatory processes and requirements should allow for customer deployment of DG technologies subject to reasonable rules and regulations.
13. When developing DG market rules, the unique attributes of each participating technology (e.g., capacity value, dispatchability, technical longevity, and reliability impacts) should be taken into account.
14. Utility participation in DG markets should be fair, reasonable, non-discriminatory, and overseen and approved by the appropriate regulatory authority.
15. The incumbent utility should be allowed to participate in the DG market under fair and competitive terms where doing so would maintain or enhance reliability, reduce costs, or facilitate broader participation by customers.<sup>2</sup> In a collaborative manner, and in formal proceedings as necessary, regulators, utilities, non-utility DG participants, and other stakeholders should consider an array of options for the incumbent utility to participate in the market including the traditional regulated model based on cost of service, the unregulated model subject to appropriate affiliate rules, as well as non-traditional approaches.
16. Policies related to DG interconnection or deployment should be fair, reasonable, not unduly discriminatory, and overseen and approved by the appropriate regulatory authorities.
17. DG should be permitted on either the customer side or the utility side of the meter in accordance with interconnection rules and other applicable regulations.
18. Utilities and DG providers should work toward appropriate and reasonable data sharing that facilitates capturing system benefits and identifying costs of DG.

## *Consumer Issues*

The Consumer Issues section is further divided into the subcategories of Consumer Protections and Consumer Education & Engagement, although a few principles address aspects of each.

### *Consumer Protections*

19. States should provide DG consumers with appropriate education and enforceable protections to guard against and respond to unsafe, unfair, or deceptive business practices by DG providers.
20. States should clearly delineate jurisdiction and coordinate among state commissions, state attorneys general, and other consumer protection entities to ensure that there are no gaps in enforcement of the laws and regulations that protect DG customers.

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<sup>2</sup> Some states have adopted laws that restrict or prohibit utility ownership of generation. In view of this, some CCIF participants abstained from agreement on this principle. This principle should not be construed as a proposal for changing existing state laws.

21. As DG technologies are deployed, consumer protection policies should be periodically reviewed and revised as appropriate. In any event, consumers should be given a clear avenue to resolve complaints.
22. States should develop standards for DG providers which are enforceable through licensing, registration, or other regulatory requirements to address financial soundness, safety, reliability, system planning, and consumer protection.
23. Utilities and DG providers, with the participation of state regulatory bodies and consumer advocates, should develop standards for data protection, access, and disclosure consistent with state requirements.
24. In developing DG policies, particular attention should be given to the cost impacts on all utility customers, including those not participating and those least able to afford such costs.

### **State policymakers should ask the following questions regarding consumer protections**

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- What protections are needed for consumers, both in their relation with their utility and with third party DG providers?
- What are the potential gaps in existing rules and regulations?
- What are the options for filling these gaps?
- What level of oversight is needed for DG providers?
- Which agency should take the lead role?
- What are the proper roles of state commissions, consumer advocates, state attorneys general, and utilities in addressing complaints?
- Are there recommendations that should be made to other organizations or agencies to address consumer protection?

### **State policymakers should consider potential unintended consequences of DG policies**

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An additional issue that spurred discussion was the potential unintended consequences of certain DG-related policies on the collection of funds for various public benefit programs and standards (such as low-income or energy efficiency). In Arizona, for example, monies are collected to fund such programs and standards on a variable basis. If DG customers avoid all their variable charges, those programs lose that incremental revenue. To address this issue in relation to the renewable energy surcharge, the Arizona Corporation Commission decided to apply the average surcharge rate of the corresponding customer class to the solar adopting customers. For states that may have similar public benefits charges and policies, participants wanted to highlight the issue to make sure such states are aware of the potential ramifications. Participants encourage states to consider the implications of this issue.

## Consumer Education & Engagement

25. States, consumer advocates, utilities, and DG providers should work together to provide potential DG customers with objective information that will help them make informed choices.
26. DG providers should provide potential DG customers with accurate information about DG-related products and services and should be held accountable for misleading or false statements.
27. States should encourage customers to complete an energy efficiency evaluation prior to acquiring DG.

### **State policymakers should ask the following questions regarding consumer education and engagement**

- What type of consumer education and outreach is needed?
- Who should supply the information?
- What are the proper roles of state commissions, consumer advocates, state attorneys general, utilities, others?
- How and when should information be disseminated?

## *Safety, Reliability & System Planning Issues*

28. DG interconnection standards, procedures, and practices must ensure the safety of the public, first responders, and electric utility workers. These standards, procedures, and practices must also protect utility and customer assets.
29. Information and applicable regulations related to the protection and safety of first responders (e.g., firefighters, police, and utility workers) who need to access DG facilities, either directly or indirectly, should be shared with DG customers, DG providers, and the general public.
30. DG deployment must be accomplished in a manner that does not compromise the continued reliability of utility infrastructure and operating systems.
31. Any positive and negative reliability impacts of DG interconnection should be recognized and accounted for so that any incremental costs and benefits of maintaining grid reliability are appropriately allocated.
32. DG deployment should not diminish infrastructure security or cybersecurity. (2013 Principle 20)
33. Transmission and distribution planning entities should consider and incorporate as appropriate state DG requirements into their planning processes.
34. Utilities should be aware that changes to utility system planning and operations may be required because of greater integration of DG technologies.

## III. Conclusion

### OBJECTIVE MET

Recognizing that the principles do not address all issues with respect to the expansive topic of DG, the consensus achieved by participating state commissioners, consumer advocates, and utility representatives is significant nonetheless. Consistent with the stated objective, participants better equipped themselves—as well as policymakers and other stakeholders via this final report—to integrate DG technologies in a safe, fair, cost-effective, and reliable manner.

### DISCLAIMER

Please note that these principles are not intended to override any individual or collective policies or positions developed by state commissioners, consumer advocates, electric utility representatives, or by the National Association of Regulatory Utility Commissioners (NARUC), the National Association of State Utility Consumer Advocates (NASUCA), Edison Electric Institute (EEI), or any other organizations referenced herein. Instead, CCIF work products are meant only to complement such policies or positions and provide a framework for additional discussion and policy development.

### ACKNOWLEDGMENTS

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- NARUC, NASUCA, and EEI, particularly the guidance of their respective leaders and the valuable input and hard work of their respective teams.
- All state commissioners, consumer advocates, and electric utility participants who worked tirelessly to draft and revise the CCIF principles and related input on DG.
- All speakers, panelists, and attendees who participated in the November 2013 Kickoff Forum in Orlando, where many of the issues addressed within this report were introduced.

### FUTURE CCIF INITIATIVES

CCIF offers participants the ability to engage in constructive debate on important energy topics. It provides a forum for state commissioners, consumer advocates, and electric utility representatives to collectively develop sound energy policies that fully consider impacts on consumers and other stakeholders. CCIF is designed to be a continuing, long-term effort to facilitate such leadership by these core groups and to address a variety of important energy issues in a collaborative, proactive manner. Therefore, we urge all interested stakeholders to stay tuned for future CCIF initiatives and events, and we specifically **invite all NARUC and NASUCA Annual Meeting attendees to join us the afternoon of Saturday, November 15, 2014, in San Francisco** (*more details at [www.CCIForum.com](http://www.CCIForum.com) in the coming months*).

# Appendix

## ACKNOWLEDGMENT OF 2014 SUMMIT PARTICIPANTS

Due to the nature of the collaborative process and the extensive degree of participation, specific principles developed within the 2014 summit process should not be attributed to specific individuals or to the organizations that he or she represents. With that understanding, the Critical Consumer Issues Forum (CCIF) acknowledges the following individuals who participated in CCIF events focused on the topic of Distributed Generation (DG):

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## ACKNOWLEDGMENT OF 2013 SUMMIT PARTICIPANTS

Because the principles developed within the 2013 summit process are embedded again within this later report, it is appropriate to acknowledge those participants again here. Please note that some names and affiliations may have changed, but they have inserted them below as printed in the 2013 report on Distributed Energy Resources (DER). While some of the 2013 participants were part of the 2014 process, others did not participate and therefore should not be construed as having considered or provided consent for the additional 2014 principles and related content. Due to the nature of the collaborative process and the extensive degree of participation, specific principles developed within the 2013 summit process should not be attributed to specific individuals or to the organizations that he or she represents. With that understanding, CCIF acknowledges the following individuals who participated in CCIF events focused on the topic of DER:

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**Hon. Mary-Anna Holden**  
New Jersey Board of Public Utilities

**Mr. Michael Hoover**  
Southern California Edison

**Ms. Anne E. Hoskins**  
PSEG Services Corporation

**Hon. John E. “Butch” Howard**  
South Carolina Public Service Commission

**Hon. Orjiakor N. Isiogu**  
Michigan Public Service Commission

**Mr. Craig S. Ivey**  
Consolidated Edison Co. of New York

**Hon. Elizabeth (Libby) S. Jacobs**  
Iowa Utilities Board

**Mr. Bob Jenks**  
Citizens’ Utility Board of Oregon

**Mr. Aaron Johnson**  
Pacific Gas & Electric Company

**Hon. Philip B. Jones**  
Washington Utilities & Transportation Commission

**Hon. Betty Ann Kane**  
DC Public Service Commission

**Ms. Elin Swanson Katz**  
Connecticut Office of Consumer Counsel

**Mr. J.R. Kelly**  
Florida Office of Public Counsel

**Hon. Robert S. Kenney**  
Missouri Public Service Commission

**Ms. Kimberly (Kim) G. King**  
Alliant Energy

**Mr. Allen Krug**  
Xcel Energy

**Hon. Lauren McDonald, Jr.**  
Georgia Public Service Commission

**Ms. Katrina McMurrian**  
Critical Consumer Issues Forum

**Mr. Lewis Mills**  
Missouri Office of the Public Counsel

**Hon. Phil Montgomery**  
Public Service Commission of Wisconsin

**Ms. Jodi Moskowitz**  
PSEG Services Corporation

**Mr. Colin Mount**  
FirstEnergy

**Ms. Diane Munns**  
MidAmerican Energy Company

**Ms. Kristin Munsch**  
Illinois Citizens Utility Board

**Ms. Cheryl Murray**  
Utah Office of Consumer Services

**Mr. Stuart Nachmias**  
Consolidated Edison Co. of New York

**Ms. Pamela A. Nelson**  
DC Office of the People’s Counsel

**Mr. Robert A. Nelson**  
Montana Consumer Counsel

**Hon. Ellen Nowak**  
Public Service Commission of Wisconsin

**Hon. Erin M. O’Connell-Diaz**  
Illinois Commerce Commission

**Mr. Andrew Owens**  
Entergy

**Mr. David K. Owens**  
Edison Electric Institute

**Mr. James R. Padgett**  
DTE Energy

**Ms. Jeanine Penticoff**  
Alliant Energy

**Ms. Hilda Pinnix-Ragland**  
Duke Energy Corporation

**Mr. Randy Pratt**  
Vermont Electric Cooperative

**Hon. John D. Quackenbush**  
Michigan Public Service Commission

**Mr. Charles J. Rehwinkel**  
Florida Office of Public Counsel

**Mr. Robert Revelle**  
Pepco Holdings, Inc.

**Ms. Martha Rowley**  
Edison Electric Institute

**Mr. David E. Rubin**  
Pacific Gas & Electric Company

**Mr. Joel Schmidt**  
Alliant Energy

**Mr. Mark R. Schuling**  
Iowa Office of the Consumer Advocate

**Hon. Doug Scott**  
Illinois Commerce Commission

**Mr. Dennis Sewell**  
Georgia Public Service Commission

**Hon. Mark Sievers**  
Kansas Corporation Commission

**Mr. Tyson Slocum**  
Public Citizen

**Ms. Holly Rachel Smith**  
NARUC

**Mr. Scott R. Smith**  
Alliant Energy

**Ms. Sarah H. Steindel**  
New Jersey Division of Rate Counsel

**Mr. Gary Stern**  
Southern California Edison

**Ms. Elizabeth Stipnieks**  
Edison Electric Institute

**Hon. Bob Stump**  
Arizona Corporation Commission

**Mr. Rick Tempchin**  
Edison Electric Institute

**Mr. Richard T. Thigpen**  
PSEG Services Corporation

**Ms. Martha Thompson**  
Duke Energy

**Mr. Matthew Tisdale**  
California Public Utilities Commission

**Hon. Betsy Wergin**  
Minnesota Public Utilities Commission

**Hon. Greg R. White**  
Michigan Public Service Commission

**Ms. Maria Zazzera**  
New Jersey Board of Public Utilities

## Leadership

### *Executive Committee*



**Colette D. Honorable**  
*Arkansas PSC Chair  
& NARUC President*



**Robert A. Nelson**  
*Montana Consumer Counsel  
& NASUCA President*



**David K. Owens**  
*EEL Executive Vice President  
of Business Operations*

### *Advisory Committee*



**Jeffrey D. Goltz**  
*Commissioner  
Washington Utilities & Transportation Commission*



**Robert S. Kenney**  
*Chairman  
Missouri Public Service Commission*



**Betsy Wergin**  
*Commissioner  
Minnesota Public Utilities Commission*



**Simon ffitich**  
*Sr. Asst. AG & Public Counsel Division Chief  
Washington State Attorney General's Office*



**Elin Swanson Katz**  
*Consumer Counsel  
Connecticut Office of Consumer Counsel*



**J. R. Kelly**  
*Public Counsel  
Florida Office of Public Counsel*



**Gregory Bollom**  
*Assistant Vice President—Energy Planning  
Madison Gas & Electric Company*



**Wayne Harbaugh**  
*Vice President of Pricing & Regulatory Services  
Baltimore Gas & Electric Company*



**Phillip R. May**  
*President & CEO  
Entergy Louisiana &  
Entergy Gulf States Louisiana*

## CCIF Executive Director



**Katrina McMurrian**  
Executive Director  
Critical Consumer Issues Forum  
(CCIF)

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Twitter: [@CCIForum](https://twitter.com/CCIForum)

A former Florida Public Service Commissioner (2006–2009), Katrina McMurrian draws upon extensive regulatory experience to organize and facilitate relevant policy forums and to advise an array of entities on key regulatory and policy issues in the energy arena. McMurrian currently serves as the Executive Director of the Critical Consumer Issues Forum (CCIF), a unique national forum in which state regulators, consumer advocates, and electric utilities—via a series of facilitated, interactive dialogues—engage in productive debate and develop consensus on key issues of importance to consumers and policymakers. McMurrian also serves as the Executive Director of the Nuclear Waste Strategy Coalition, an ad hoc organization representing the collective interests of member state utility regulators, consumer advocates, tribal governments, local governments, nuclear-generating utilities, utilities with shutdown reactors, and other public and private sector experts on nuclear waste policy matters.

McMurrian frequently interacts with Congressional offices; Administration officials with the Department of Energy (DOE); state and federal utility regulators; state and national consumer organizations; industry representatives; and numerous other public and private stakeholders on matters related to the work of the NWSC (nuclear waste policy) and the CCIF (grid modernization, distributed generation, etc.)

As a commissioner, McMurrian decided numerous cases involving Florida's electricity, gas, communications, water, and wastewater providers; appeared before Congress; worked with other state and federal agencies; and participated on a number of influential national policy boards. She served on several National Association of Regulatory Utility Commissioners (NARUC) committees, including Electricity, Nuclear Issues (Vice Chair), Consumer Affairs, and Education & Research, as well as on collaboratives with the Federal Energy Regulatory Commission (FERC), including Demand Response (Co-Chair), Smart Grid, and Competitive Procurement. She also served on the Executive Committee of the NWSC, Advisory Council to the Electric Power Research Institute (EPRI) Board, EPRI Energy Efficiency/Smart Grid Group, Keystone Energy Board, Eastern Interconnect States Planning Council, and the Southeastern Association of Regulatory Utility Commissioners (SEARUC). Additionally, McMurrian Co-Chaired the 2009 NARUC/DOE National Electricity Delivery Forum.

A Northwest Florida native, McMurrian received a Bachelor's degree in finance from Florida State University in 1994 and an MBA from FSU in 1998.

## **CCIF Events on DG**

### **Fall Kickoff Forum**

November 16, 2013  
Hilton Orlando Bonnet Creek  
Orlando, FL  
Collocated with the NARUC and NASUCA Annual Meetings in Orlando  
Approximately 200 participants

### **Spring Summit 1**

March 17–18, 2014  
The Westin San Diego  
San Diego, CA  
8 State Commissioners + 1 Staff; 10 Consumer Advocates; 7 Investor-Owned Electric Utility Reps;  
2 Regulated Electric Cooperative Reps; 4 EEI Reps + 1 CCIF Rep

### **Spring Summit 2**

April 3–4, 2014  
Hilton Chicago O'Hare Airport  
Chicago, IL  
17 State Commissioners + 2 Staff; 16 Consumer Advocates; 17 Investor-Owned Utility Reps;  
2 Regulated Electric Cooperative Reps; 5 EEI Reps + 1 CCIF Rep

### **Spring Summit 3**

May 12–13, 2014  
Hyatt Boston Harbor  
Boston, MA  
19 State Commissioners; 16 Consumer Advocates; 19 Investor-Owned Utility Reps;  
1 Regulated Electric Cooperative Rep; 5 EEI Reps + 1 CCIF Rep

## CCIF Kickoff Agenda



Presents the CCIF 4<sup>th</sup> Annual Kickoff Forum:

### ***Distributed Generation: Consumer-Focused Options for Policymakers & Regulators***

**Saturday, November 16, 2013 ♦ 2:00–5:15 pm**

Hilton Orlando Bonnet Creek ♦ 14100 Bonnet Creek Resort Lane ♦ Orlando, FL 32821

***Floridian Ballroom B & C (Lobby Level)***

#### **AGENDA**

- |             |   |
|-------------|---|
| 1:30 – 2:00 | <b>Registration Open</b><br>Program begins promptly at 2:00 PM.   |
| 2:00 – 2:05 | <b>Welcome to Orlando</b><br><i>Hon. Lisa Polak Edgar, NARUC 2<sup>nd</sup> Vice President and Florida Public Service Commissioner</i>  |
| 2:05 – 2:15 | <b>Introduction &amp; Expectations</b><br><i>Hon. Philip B. Jones, NARUC President and Washington Utilities &amp; Transportation Commissioner</i>   |
| 2:15 – 4:00 | <b>DG Lessons Learned &amp; Future Approaches</b><br>Panelists will expand upon the CCIF framework on DG with a technical exploration of the benefits of DG and how the electric grid enables DG options. They also will explore lessons learned from current DG public policy initiatives and regulatory actions as well as address potential future approaches that provide a balanced path forward.<br><br>Moderator: <i>Mr. David K. Owens, Executive Vice President of Business Operations, Edison Electric Institute</i><br><br>Panelists: <ul style="list-style-type: none"> <li>• <i>Hon. Ellen Nowak, Commissioner, Public Service Commission of Wisconsin</i></li> <li>• <i>Ms. Elin Swanson Katz, Consumer Counsel, Connecticut Office of Consumer Counsel</i></li> <li>• <i>Mr. David Ozment, Senior Director, Energy, Walmart Stores, Inc.</i></li> <li>• <i>Ms. Jean Wilson, Senior Vice President, Americas Utility &amp; Commercial, SunPower Corporation</i></li> <li>• <i>Mr. Christopher P. Johns, President, Pacific Gas &amp; Electric Company</i></li> <li>• <i>Mr. Kim Colberg, Chief Executive Officer, Linn County Rural Electric Cooperative</i></li> </ul> |
| 4:00 – 5:00 | <b>Consumer Protections, Complaint Resolution &amp; Education</b><br>Using the CCIF principles on DG as a starting point, panelists will dig deeper into a number of consumer issues related to investment in DG. Do existing rules and regulations adequately protect consumers? Where should consumers go for more information about DG or to resolve complaints with providers?<br><br>Moderator: <i>Ms. Janee Briesemeister, Senior Legislative Representative, AARP</i><br><br>Panelists: <ul style="list-style-type: none"> <li>• <i>Hon. Jeff Goltz, Commissioner, Washington Utilities &amp; Transportation Commission</i></li> <li>• <i>Mr. John Howat, Senior Energy Analyst, National Consumer Law Center</i></li> <li>• <i>Mr. Phillip R. May, President &amp; CEO, Entergy Louisiana, LLC &amp; Entergy Gulf States Louisiana, L.L.C.</i></li> </ul>   |
| 5:00 – 5:15 | <b>Closing: Key Takeaways &amp; Next Steps</b><br><i>Ms. Paula M. Carmody, NASUCA President and Maryland People's Counsel</i>   |
| 5:15        | <b>Wine &amp; Cheese Reception</b>  |



## CCIF Sample Summit Agenda



# Distributed Generation: A Balanced Path Forward

## *Providing Customer Choice While Ensuring Reliability*

May 12-13, 2014

**Hyatt Boston Harbor**  
**Grand Ballroom (2<sup>nd</sup> Floor)**

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### Agenda

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*During CCIF's 2014 summit series, state commissioners, consumer advocates, and electric utility representatives will build upon the foundation of CCIF's 2013 principles on distributed generation (DG). By digging deeper into these complex issues, developing consensus where possible, and fleshing out policy and regulatory options, participants will better equip themselves – as well as policymakers and other stakeholders via the final report – to enable DG integration in a safe, fair, and reliable manner.*

#### Day 1 (May 12<sup>th</sup>)

- 7:30 – 8:30**     **Hot Breakfast Buffet** (*Grand Ballroom, 2<sup>nd</sup> Floor*)  
*(Please note that the meeting begins promptly at 8:30 AM in Grand Ballroom.)*
- 8:30 – 8:45**     **Welcome, Introductions, and Summit Process Discussion**  
**Katrina McMurrian, CCIF Executive Director**
- Recognition of CCIF Leadership & Introduction of Participants
  - Overview of CCIF Purpose, Leadership, Process, Successes
  - Description & Discussion of Summit Process & Goals and Expectations for Final Report
- 8:45 – 10:45**     **Guest Stakeholder Panel & Group Discussion**  
Panelists will address key items from the summit agenda, followed by an hour of interactive dialogue with summit participants.  
**Moderator: Katrina McMurrian, CCIF Executive Director**
- **Ms. Lori Bird, Senior Analyst, Market & Policy Impact Analysis Group, Strategic Energy Analysis Center, National Renewable Energy Laboratory (NREL)**
  - **Mr. Bob Gibson, Vice President of Education & Outreach, Solar Electric Power Association (SEPA)**
  - **Mr. David Ozment, Senior Director of Energy, Wal-Mart Stores, Inc.**
- 10:45 – 11:00**     **Break**



- 11:00 – 11:30 Arizona’s Experience with DG-Related Consumer Protection & Outreach Issues**  
**Hon. Bob Stump, Chairman, Arizona Corporation Commission**  
 Chairman Stump will share the Arizona Corporation Commission’s experience to date with an active distributed solar market, the positive and negative implications for consumers, and things to be prepared for in other jurisdictions and with other forms of DG to best inform and protect consumers. Following Chairman Stump’s initial remarks, participants are encouraged to ask questions and engage on issues that should inform the following discussion.
- 11:30 – 12:30 Consumer Protections, Complaint Resolution, Outreach & Education**  
**Facilitated Discussion Featuring All Participants**  
 Participants will discuss the need for improved consumer protections, complaint resolution methods, and consumer outreach & education. Specifically, we’ll explore:
- Potential gaps in existing rules & regulations and options for filling such gaps
  - Recipients and nature of DG-related complaints and options for best addressing such complaints
  - Opportunities and best practices for consumer outreach and education about DG
- 12:30 – 1:00 Lunch Buffet** (*Grand Ballroom*)
- 12:30 – 2:30 Consumer Protections, Complaint Resolution, Outreach & Education** (*Continued*)  
**Facilitated Discussion Featuring All Participants**
- 2:30 – 2:45 Break**
- 2:45 – 3:15 Safety, Reliability & System Planning Issues**  
**Facilitated Discussion Featuring All Participants**  
 Participants will address additional safety and reliability issues.
- 3:15 – 4:55 Regulatory Issues**  
**Facilitated Discussion Featuring All Participants**  
 Participants will identify and explore options relating to regulatory issues such as pricing of DG (e.g., net metering, feed-in and other tariffs); approaches to ensure recovery of fixed costs (e.g., higher fixed charges, other revenue stabilization mechanisms); impacts on reliability; and others.
- 4:55 – 5:00 Recap & Plans for Day 2**  
**Katrina McMurrian, CCIF Executive Director**
- 5:00 – 6:00 Networking Reception** (*Harborside Ballroom, 1<sup>st</sup> Floor*)
- 6:00 – 9:00 Plated Dinner & Continued Issue Discussion** (*Harborside Ballroom, 1<sup>st</sup> Floor*)

## Day 2 (May 13<sup>th</sup>)

- 7:00 – 8:00**     **Hot Breakfast Buffet** (*Grand Ballroom, 2<sup>nd</sup> Floor*)  
*(Please note that the meeting begins promptly at 8:00 AM in Grand Ballroom.)*
- 8:00 – 10:00**     **Regulatory Issues** (*Continued*)  
***Facilitated Discussion Featuring All Participants***
- 10:00 – 10:15**     **Break**
- 10:15 – 11:15**     **Regulatory Issues** (*Continued*)  
***Facilitated Discussion Featuring All Participants***
- 11:15 – 11:30**     **Boxed Lunch** (*Grand Ballroom*)
- 11:30 – 1:30**     **Barriers to Market Entry & Whether/How to Remove Them**  
***Facilitated Discussion Featuring All Participants***  
Participants will discuss barriers to market entry for DG providers and how to level the playing field across types of DG; for incumbent utilities (regulated/unregulated) and how to level the playing field with unregulated DG providers; and for consumers who want to install DG.
- 1:30 – 1:45**     **Break**
- 1:45 – 3:00**     **Next Steps to Advance Key Concepts**  
***Facilitated Discussion Featuring All Participants***  
Participants will determine CCIF's role in advancing key concepts and a balanced path forward, including:
- Approach for sharing CCIF work products on DG (communications plan)
  - Collaboration on future federal initiatives (Administration/DOE)
  - Collaboration with stakeholder groups
- 3:00**                **Meeting Adjourns**

## Guest Stakeholder Summaries

CCIF invited five stakeholder representatives to participate in guest stakeholder panels at the beginning of CCIF Summits 2 and 3 to provide participating state commissioners, consumer advocates, and electric utility representatives with additional perspectives on issues related to DG. Each guest stakeholder panel discussion allowed for 20-minute presentations, followed by approximately an hour of interactive dialogue with summit participants. Participants appreciated the opportunity to hear from and engage with these experts, and CCIF would like to acknowledge the following five individuals for their contributions to our productive dialogue:

- Tom Beach, Principal, Crossborder Energy, Consultant to Solar Energy Industries Association (SEIA)
- Lori Bird, Senior Energy Analyst, National Renewable Energy Laboratory (NREL)
- Bob Gibson, Vice President, Education & Outreach, Solar Electric Power Association (SEPA)
- David Ozment, Senior Director of Energy, Walmart
- Rebecca Stanfield, Deputy Director for Policy, Midwest Program, Natural Resources Defense Council (NRDC)

We invited the five presenters to provide summaries of their presentations for inclusion in the final report so that others may benefit from their perspectives as well. Summaries from four of the presenters are included below.

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### **Tom Beach, Principal, Crossborder Energy, Consultant to SEIA Solar Energy Industries Association (SEIA)**

*Presented at CCIF Summit 2 (Chicago) on April 3, 2014*

The electric utility industry faces important, perhaps unprecedented, opportunities and challenges. The opportunity is that achieving a major reduction in carbon emissions by 2050 is likely to require the widespread electrification of important sectors of the U.S. economy, including buildings and transportation. This could dramatically increase electricity's share of primary energy use in the U.S. The challenge is that the traditional structure and business model of electric utilities in the U.S. have been called into question by new technologies in distributed generation (DG) and storage that provide consumers with new options for obtaining electric service. The challenge is how to adapt the existing electric system infrastructure, much of which continues to be necessary and vital, to the new realities of the expanded choices available to electric customers. This adaptation will need to include changes to the regulatory structures and business models under which U.S. utilities operate.

#### **Market Development & Deployment Issues**

In the past, electric utilities have grown through exploiting economies of scale. In the future, due to the availability of economic DG and storage resources, there may no longer be economies of scale available through centralized generation and transmission. Instead, utilities will need to focus on exploiting "economies of sharing" with their customers. For example, an on-site storage resource can be shared between a customer and the utility, allowing the customer to improve the reliability and resiliency of its service, while providing a new means for the utility to meet peak demand at both the system and circuit levels. Considering financial resources, customers and DG providers who use and

build distributed resources will provide new sources of capital that will be vital to funding the transition to a cleaner energy infrastructure.

### Consumer Education & Engagement

A significant benefit of the growth of DG and other demand-side resources is a higher level of education and engagement from customers in how their energy is provided. This does not have to be limited to customers who actually install DG on their premises. For example, community-based DG options are being tested in a number of states that can allow consumers the choice to subscribe to the output of a local supplier of renewable generation, with the utility continuing to provide integration, delivery, and billing services.

### Customer Protection

The CCIF's principles for DG emphasize treating customers fairly and setting rates for all customers based on cost causation. These principles should apply to customers who adopt DG as well as to those who do not. For example, setting rates applicable to DG customers should consider their much different load profile than standard customers, a profile that may be much less expensive to serve than the class average. In addition, DG customers are contributing new, long-lived, clean resources to the system. Accordingly, policies applicable to DG, such as net metering, should be evaluated using a long-term analysis, over the expected lives of the DG systems, just as other new utility resources are evaluated. This analysis should recognize that, in the long-run, few utility costs are fixed, and DG will allow the utility to avoid capacity-related as well as energy-related costs. Finally, regulators seeking to balance the interests of customers who install DG and those who do not should recognize that DG customers bear new risks that traditional utility customers do not, such as the risks associated with the long-term operation and maintenance of the DG equipment. When the DG customer assumes such risks, it contributes to the overall reliability and resiliency of the entire system. Finally, it should be recognized that DG customers have made long-term investments in an important public purpose goal—a cleaner, more resilient energy infrastructure—that may be far larger than the average utility customer's month-to-month contributions to utility public purpose programs.

### Safety, Reliability & System Planning Issues

Integrating DG presents new challenges for utilities. The impact of DG on utilities is similar to other demand-side resources in many respects (energy efficiency and demand response), in terms of reducing the loads which customers place on the grid. That said, DG also is different—it is generation interconnected to the grid, with additional safety and operational impacts. Permitting and interconnection of DG should be streamlined, and utility distribution planners need to incorporate the impacts of widespread DG adoption into their work in ways that are transparent and fair to all customers. The locational value of DG must be better understood and made more visible, to encourage siting where there will be the most system benefits for all ratepayers.

### Financial & Regulatory Issues

The utility industry has faced the challenge of integrating demand-side resources before, when energy efficiency and demand response programs first became widespread. The industry successfully adapted, developing a standardized set of cost-effectiveness tests to balance the often-competing perspectives of participants, non-participants, the utility, and society as a whole. The net metering

debate should be addressed in a similar fashion, using data, careful analysis, and rate design changes to achieve the right balance between all of these interests. Ultimately, the tension between traditional utility service and the new customer choices available through DG and storage will have to be resolved through changes to the utility business model to reward not the growth of rate base, but the efficient integration of disparate resources, reliable service, safety, and environmental stewardship.

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**Lori Bird, Senior Energy Analyst**  
**National Renewable Energy Laboratory (NREL)**

*Presented at CCIF Summit 3 (Boston) on May 12, 2014*

### Regulatory Considerations Associated with the Expanded Adoption of Distributed Solar

- Solar PV installations have been growing rapidly, but PV generation still represents a small fraction of total electricity generation nationally (<1%). The U.S. installed 4.8 GW of PV in 2013 (3.4 GW in '12) and 2.1 GW in Q4 '13. Utility-scale PV capacity represent more than half of installations in 2013.
- PV development has been concentrated in several states. CA, AZ, and NJ each have more than 1 GW of cumulatively installed PV. However, this trend is changing slowly as 16 states currently have 100 MW or more of PV capacity and 11 states each installed more than 50 MW in 2013 alone. 92% of the all systems are residential, with 131,000 residential systems installed in 2013. Hawaii is facing significant barriers with large penetration of PV on the grid. 25% of circuits in Oahu were at or above 100% daytime minimum load in Jan. 2014 (up from 13% in Sept. '13)
- System prices in AZ, CA, MA, and NY, for systems between 2.5–10 kW, fell on average 11% between 2012 and 2013. This is consistent with declines experienced in the previous 4 years. Q1 2014 pricing trended downwards as well—~8% below Q1 2013 for host-owned systems.
- Key issues and challenges for regulators in managing the growth of distributed generation include balancing the following objectives: sufficient revenues are collected to maintain the grid, fair and equitable rates, customer choice, policy goals are achieved, a level playing field for new technologies, and competition and provision of customer services.
- Key considerations for rate design and potential changes in rate structures include the following. Regulators strive to develop fair and equitable rates, but there is some degree of cost shifting embedded in rates (e.g., commercial vs. residential customers, low-income customers). For distributed generation, one key issue is that commercial customers pay demand charges which cover T&D costs while residential customers typically pay volumetric rates. Another issue is whether customers are offsetting all of their consumption with DG. Finally, distributed generation use is not the only customer behavior with implications for system costs and ratepayer equity (e.g., vacation homes; residential consumers who use large amounts of peak power). Given these and other considerations, how can rates be designed to align more closely with costs?
- A variety of options exist for regulators to address distributed PV and these may be used in combination. They include: net metering, two-way rates (e.g., value of solar), customer charges (e.g., fixed charges, demand charges, minimum bill), time-based rates, and disaggregated rates (cost of service model). Other options exist for addressing utility revenue loss issues, such as decoupling and performance incentives.

- Net metering is widely adopted by states (available in 43 states). Legislative changes recently have included expanding net metering (e.g., raising caps), which is the most common legislative change, adding virtual or community net metering, enabling utilities to place fees on net metered generators, and studies. Most states are currently well below their net metering caps, but some states may reach these caps in the next few years.
- Value-of-solar tariffs have emerged in some jurisdictions (e.g., Austin Energy, Minnesota). These differ from net metering in that the payment to the PV customer is based on the value of the PV. In these examples, the tariff is applied to all PV system generation. Customer consumption and value of solar revenues may be netted on the utility bill.
- The value of solar has been calculated in a variety of studies and there is no consistent methodology (see Rocky Mountain Institute Review of Solar PV Benefit and Cost Studies 2013 for a comparison). The benefits of PV include: the generation and capacity value, transmission and distribution deferrals, line loss savings, fuel price hedge, and environmental benefits. Costs can include: administrative costs, interconnection costs, and integration costs.
- Some considerations in using the value-of-solar approach are challenges in gaining consensus on calculating the value, determining what benefits/costs to include, and the methodology to use. One advantage is that customers continue paying fully embedded rates. Some concerns include potential tax implications of a two-way rate, uncertainty for the solar market if the calculation changes frequently, and if the value of solar tariff is below the levelized cost of energy (LCOE) of solar, then the market could stagnate or other incentives may be needed.
- Other rate options include: fixed charges, demand charges, and time of use rates. Fixed charges can be easily administered, but can be regressive and do not account for consumption patterns. A minimum bill concept, which has not been implemented to date, could vary depending on the amount of consumption offset by PV. Demand charges could be confusing to residential customers, but are based on usage patterns so aligned more directly with costs. Time-of-use rates account for the value of energy consumed/delivered and are important for PV economics, but could be confusing or challenging for some customers.
- Cost of service-based rates (or a pay for services business model) are another option, but the use of these would represent a significant shift in rate design. These have not yet been implemented. Under this approach, customers that use a particular service pay for the costs of that utility service, and customers that don't use the service are not required to pay for it. DG owners could be compensated for the services they provide to the grid.
- New utility business models could address concerns about lost revenues. Options include: utility build-own-operate, utility-led community solar projects, utility partnership and investments in 3rd-party leasing companies, value added consulting services, virtual power plant operator, and energy services utility model. Impact on utility revenues depends on the utility role. For regulators, considerations include competition, customer choice, and provision of customer services.
- 3rd-party ownership continues to dominate the residential sector in several markets. The fraction of 3rd party owned systems in AZ & CA has leveled off in the past year with continued sales of host-owned systems and new availability of residential loans. Rebounding of the housing market allows systems to be financed through mortgages or home equity loans. 3rd-party ownership in the large-scale CA Solar Initiative market dropped from 64% in 2008 to 23% in 2013.

- Some key questions that may help frame this discussion are: Are utilities positioned to capture the net benefits of placing distributed PV at specific locations on the utility system? Are utilities positioned to undertake infrastructure upgrades necessary to accommodate higher levels of distributed PV? Given the expected penetration levels, how will distributed PV affect each stakeholder group? What are the costs/benefits of distributed PV for different stakeholders? Are stranded assets a possibility? What regulatory changes need to occur to facilitate the development of new utility business models?

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**Bob Gibson, Vice President, Education & Outreach**  
**Solar Electric Power Association (SEPA)**

*Presented at CCIF Summit 3 (Boston) on May 12, 2014*

**The Future of Solar and Electric Utilities: Is Solar Simply “Disruptive” or Will it Become “A Part of What We Do”?**

In 2014, two important trends in solar are affecting the electric utility industry.

One, new solar growth is starting to be driven by economics. While virtually all of the dramatic growth of solar in the U.S. over the past several years has been fueled by policy and mandates, solar is on the verge of seeing its continued growth driven more and more by cost. A quiet turning point came in 2013 when David Eves, CEO of Public Service of Colorado (part of Xcel), told the Denver Business Journal that responses to an RFP for new power generation had brought surprising results. “This is the first time that we’ve seen, purely on a price basis, that the solar projects made the cut—without considering carbon costs or the need to comply with a renewable energy standard,” Eves said. Other examples of increasingly cost-effective utility-scale solar have emerged in 2014. This trend suggests that utilities should see solar as an increasingly attractive option for meeting new demand for electricity through their ‘traditional’ resource planning and procurement process.

Two, despite solar still meeting less than one percent of U.S. electric generation, distributed solar has emerged as a leading influence for change in the central-station focused electric utility business. This is highlighted by the rise of solar leasing arrangements in a dozen states that give electricity customers an option to save money on utility bills through self-generation with solar. The offer to install solar with no upfront cost and a promise to see immediate utility bill savings has turned the solar value proposition on its head. Affordable distributed solar challenges electric utilities to rethink their relationship with the customer and assess the business services they are best positioned to provide in order to survive and thrive in a more competitive market.

One of the current sticking points in the distributed solar discussion is over value. Solar’s value seems obvious to many. The gleaming blue and black photovoltaic panels absorbing sunshine are daily advertisements for the value of solar power—clean, fuel- and pollution-free electricity located right at the point of use. Less obvious is the value of the connection to the grid. It is the rare electricity customer who understands that the photovoltaic panels do not work without the grid, barring a significant investment in batteries and a willingness to manage one’s electricity supply. But the grid is largely invisible to all users, a system that is universally depended upon to be always-on and reliable, such a constant in our lives that we don’t even think about it, that is unless a storm knocks down a power line.



In 2014 there is regulatory and legislative movement in states across the country to assess and adjust the solar transaction, from revisiting net metering policies to considering new tariffs that attempt to balance the value of solar and the value of the grid.

Utilities are increasingly focused on turning solar into an asset, rather than just dealing with it as something disruptive. In addition to assessing solar as a competitive generation source in integrated resource planning and procurement, one that can provide both energy and capacity, utilities are investigating making solar a part of a wide variety of new services and business offerings. For regulated utilities, expanding into some of these areas may require regulatory change.

Utilities are assessing how they can strengthen their distribution (and to a degree, transmission) systems to more effectively manage variable and distributed generation. As solar penetration grows, it becomes part of the fabric of utility operations. A few years ago, interconnection requests at the California utility PG&E was a hands-on, time-consuming process. Today, PG&E reviews 3,000 solar interconnection requests a month and the process is almost entirely automated. It now takes an average of four days to approve an interconnection request and PG&E's goal is to shrink that to one day.

Managing solar growth puts emphasis on what utilities already do well—operating the grid—and adds value to ongoing 'smart grid' investments. Utilities are incorporating solar forecasting into planning and operations. It also brings focus to the feasibility of utilities managing—and possibly owning—solar-related assets such as networked 'smart' inverters of PV systems and energy storage in a variety of sizes, technologies, and applications.

Solar will become part of a suite of inter-related resources and tools that include energy efficiency and demand response. The bottom line is that to leverage the full value of solar as part of the grid of the future, solar will not be treated in isolation but as part of an integrated solution.

The rise of distributed solar is a wake-up call for utilities to the need to become genuinely and thoughtfully focused on the customer. This includes responding to customer interest in choices in solar, particularly in solar as a cost-effective alternative.

Utilities are procuring utility scale solar to serve all customers, assessing opportunities to have a share in the rooftop solar market (both residential and commercial), and expanding their role as a partner and provider of community solar. Community solar installations provide a solar option to the 75% of homeowners who want to purchase solar but do not have roofs suitable for PV.

"The rising utility interest in community solar is a sign that utilities are more and more thinking about solar not as a threat...but as a part of 'something we do'", says Stephen Frantz, solar program planner at the Sacramento Municipal Utility District, one the most 'solar-experienced' utilities in the country. "It's a very good way for the utility to play a role that it plays well while responding to increasing customer interest in solar."



**David Ozment, Senior Director of Energy**  
**Walmart**

*Presented at CCIF Summit 3 (Boston) on May 12, 2014*

**Background/Overall Thoughts on Distributed Generation:**

- In 2005 Walmart announced three broad environmental sustainability goals:
  - To be supplied by 100% renewable energy
  - Create zero waste
  - Sell sustainable products
- In April 2013 Walmart announced two renewable energy and energy efficiency goals to be accomplished by the end of 2020:
  - Globally drive the production or procurement of 7 Billion renewable kwh
  - Globally reduce the kwh/sq.ft. energy intensity required to power our buildings by 20% versus 2010
- Renewable Energy/distributed generation examples: In the U.S. we have over 250 onsite solar systems in 12 different states and Puerto Rico; roughly 40 Bloom Fuel Cell Systems in CA; have tested micro wind turbines on parking lots; have a 1MW utility scale wind turbine at a distribution center in CA, and are testing approximately 12 small battery storage systems. In addition to onsite renewable generation we have purchased the output from a windfarm in the Texas deregulated market.
- The majority of our onsite projects have been financed through Power Purchase Agreements or operating leases. We like this approach for a couple of reasons. One, it allows our partners to do what they do best, install and operate the systems and allows Walmart to do what it does best which is operate retail stores; secondly, it allows us to focus our capital on building new stores, and investing in energy efficiency.
- The cost of renewable energy and other distributed generation has dropped significantly over the past five years and will continue to drop.
- Companies are turning to renewable energy and distributed generation for a number of reasons such as: adoption of Corporate Sustainability goals, business continuity, security, and as a means to provide long term cost/budget certainty for one of their largest operating expenses.
- We're not opposed to partnering with utilities on distributed generation projects, but to date only one of our onsite solar projects is with a utility.
- Distributed Generation is a "game changer" and will play a key role in the Utility Grid of the future.
  - Successful utilities will reinvent themselves; utilities are not immune from product substitution
  - Utility regulation will go through the same transition

**Financial & Regulatory Issues:****Net metering:**

- Net metering is an enabler for successful onsite generation programs/installations
- Net metering rules are needed for various sizes and application of onsite generation; in CA, rules address systems less than 1 MW and systems larger than 1 MW
- It's not Walmart's goal to be a net producer/exporter of generation as a result of our onsite solar installations

**Standby Charges/Stranded Investment:**

- Standby charges need to be carefully designed to reflect various customer classes, loads, so forth, to reflect the cost and benefit to the system. As with net metering rules, standby charges can be an enabler, or roadblock to distributed generation. One size does not fit all in this area; a lot of independent analysis needs to be done on this subject to design rate structures that balance customer and utility needs.
- Most Industrial and Commercial customers pay their full cost of service through demand charges. The recent CA study indicated commercial customers were paying more than 100% of their cost under existing rate structures.
- Even residential customer net usage can cover the utility's investment to serve, regardless of having or not having solar on their rooftop.
- Stranded investment may not be as big an issue as some may suggest, but will also vary by customer class, current rate design, type and size of distributed generation, so forth. So long as customers' energy use covers the utility's investment to serve there is no stranded investment.
- In real life applications, utility system design/transformer sizing is not that exact/precise (even at the residential level). For example, at a new Walmart store, the transformer size chosen rarely changes, regardless of having solar. Utility transformer purchasing practices for transformer sizes (1000 KVA, 1500 KVA, 2000 KVA) generally dictate the transformer that will be used, and solar that impacts peak demand 10%–15% will not change the transformer size used.
- In states like GA, NC, SC, TX, OK, LA, where customers can choose between utilities due to utility territorial allocation rules within the states, revenue generated from the store with solar would support the investment to serve without harming other ratepayers and the utility would compete (and not ask for a stranded investment contribution) to serve the project.
- Utilities do not ask for stranded investment cost recovery when customers take load off of the system through investments in energy efficiency (that has an equal to or greater than impact than solar).
- For those utilities advocating standby charges in traditionally regulated states, should their rates be unbundled as a first step to remove the energy component from the analysis?

**Market Development & Deployment Issues:**

- Utilities are moving towards rate designs giving customers choices/options to procure renewable energy. Examples include Duke Energy's recent Green Tariff; Dominion VA Power's Green Tariff; Utah legislation creating opportunities for customers to purchase renewable energy.

- Net metering rules, Standby Charges, Interconnection Agreements, the ability of customers to use third party financing such as Power Purchase Agreements (PPAs), the ability for customers to use Operating Leases can either promote distributed generation growth or inhibit distributed generation growth.
- PPAs: Customers view PPAs as a way to finance distributed generation such as solar, not as means to break the utility compact.
- Best Practices: We should take advantage of and leverage what customers, other states and utilities have learned to continue developing better rates, options, overall approaches.

Consumer Issues (further divided into subcategories “Consumer Protections” and “Consumer Education & Engagement”):

- There was discussion among attendees on the issue of consumer protection, education, and engagement specifically in the area of residential solar PPAs and Leases in certain states, and the status and need for more work in this area.

Safety, Reliability & System Planning Issues:

- Under the Utility of Future Model safety, reliability, systems planning, resource planning must be different. For the first time, distributed generation, coordination, synchronization, traditional utility generation, T&D design, all have to come together to provide the energy supply and distribution system of the future. Utilities will continue to play a predominant role, but they will no longer be 100% end-to-end owners.



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