CCIF

CRITICAL CONSUMER ISSUES FORUM

Connecting Communities

Smart Cities, Enabling Technologies, and the Grid

July 2017

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INTRODUCTION

A growing number of communities across the country are busy planning and implementing a range of projects to make their communities smarter – more connected, data-driven, inclusive, mobile, sustainable, and resilient – ultimately, more livable. While there appears to be no universally accepted definition, the catchy "smart city" label is used to describe a wide variety of initiatives that simply are aimed at improving community life using digital technology.[1]

In fact, the "smart city" concept is not limited to cities. Such efforts are underway in areas as small as a neighborhood and as large as a state. Therefore, this report deliberately uses the broader term "smart community" or "connected community" with exceptions as warranted. Smart initiatives vary not only in size, but also in strategy and approach. In any case, they share a common emphasis on benefitting communities and solving real-world problems.

CCIF's concentration on smart communities recognizes the importance of this paradigm shift and its increasing relevance to the three core groups – state utility regulators, consumer advocates, and energy company representatives – for which CCIF discussions are focused. As highlighted herein, many smart community projects are already underway, and community leaders are reaching out to regulated energy companies to achieve many of their objectives in a more collaborative and "unconventional" manner. Therefore, the three core groups need to be aware of these initiatives and prepared for two distinct types of roles. First, they will continue to fulfill their traditional adjudicatory and oversight roles concerning any smart community projects that necessitate regulatory approval. Second, these groups have the potential to collaborate, advise, or partner with smart communities in ways that could result in long-term benefits for all customers regardless of their exact location.

The CCIF process afforded participants an opportunity to directly engage with a number of city representatives and other smart community experts about their initiatives, motivations, lessons learned, and the value of the three core groups' awareness and potential involvement. Among many takeaways from these exchanges, CCIF participants learned that they have been dealing with smart community issues (such as energy-efficiency upgrades for low-income neighborhoods, resiliency planning, advanced metering infrastructure, weatherization, electric vehicle charging infrastructure, etc.) for some time. Therefore, while "smart community" is not easily defined, it is also not overly complicated and offers opportunities that are worth exploring (e.g., using infrastructure more efficiently).

By conveying what CCIF participants learned from experts over the past year, this report attempts to clarify the somewhat amorphous "smart community" concept, to focus on areas of particular relevance to the three core groups, and to identify potential roles with respect to smart initiatives. As with our prior publications, CCIF trusts that the valuable perspectives reflected within prove instrumental as we build upon these ideas through further constructive dialogue between CCIF participants; leaders at the local, state, and federal levels; and the broader stakeholder community.

Through the CCIF discussions, participants recognized that there is more to learn about smart communities, particularly regarding impacts on the relevant utility sectors, their customers, and the regulatory and policy arenas. With this in mind, CCIF may initiate additional outreach on this topic in the future.

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[1] Jesse Berst, Smart Cities Council, as featured in *What Is a Smart City?* by Sophie Quinton, STATELINE, April 26, 2016. http://www.pewtrusts.org/en/research-and-analysis/blogs/stateline/2016/04/26/what-is-a-smart-city

THE "SMART COMMUNITY" CONCEPT

Smart Community Definition

Although participants achieved a better understanding of the "smart community" concept as a result of the CCIF dialogue, the more commonly used "smart city" term proved a persistent challenge. First, there is inherent confusion when using the word "city" to describe initiatives that are not limited to cities. Smart initiatives may be pursued within a neighborhood, town, village, city, county, or even a state. While recognizing that the "smart city" term appears to be sufficiently established in our nomenclature, CCIF participants deliberately opted to use the term "smart community" or "connected community" to be more inclusive of various initiatives. Other hurdles associated with the terminology include the relative newness of the concept in the regulatory space, the broad range of projects that appear to fit under the "smart community" umbrella, and, finally, the well-documented lack of a universally accepted definition. By engaging with several experts at the summits, participants largely overcame these hurdles, and via this report, CCIF aims to share what participants learned about smart communities.

As gleaned from CCIF participants and other experts, a "smart city" can be defined or described as:

> "one that has digital technology embedded across all city functions." – *Smart Cities Council*[2]
>
> "a paradigm shift in culture and method as to how a government thinks, how a government plans, and how a government operates." – *Kate Garman, City of Kansas City, Missouri*
>
> "leading with technological innovation." – *Brooks Rainwater, National League of Cities*[3]
>
> "the integration of technology into a strategic approach to sustainability, citizen well-being, and economic development." – *Navigant Consulting, Inc.*[4]
>
> "one that takes a system-wide view and endeavors to accomplish more with existing investments." – *Kim Zentz, Urbanova*
>
> "effective integration of physical, digital and human systems in the built environment to deliver a sustainable, prosperous and inclusive future for its citizens." – *British Standards Institution*[5]
>
> "one that employs a network of digital sensors, information controls, Internet-of-things technology, and automation to create a system that improves quality of living by reducing costs, creating new and better services, improving sustainability, and helping the city grow and compete for businesses, institutions, and residents." – *ScottMadden, Inc.*[6]

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[2] The Smart Cities Council is a coalition of leading technology companies with deep expertise in areas such as energy, water, communications, and transportation that work to create cities that exemplify the Council's three core values: livability, workability and sustainability. The Council's description of a smart city may be found at this link: http://smartcitiescouncil.com/smart-cities-information-center/definitions-and-overviews.

[3] *What Is a Smart City?* by Sophie Quinton, STATELINE, April 26, 2016. http://www.pewtrusts.org/en/research-and-analysis/blogs/stateline/2016/04/26/what-is-a-smart-city

[4] *Smart Cities: Trends, Opportunities, and Challenges*, presentation by Rob Wilhite, Managing Director, Navigant Consulting, Inc., for Envision America Workshop, March 6, 2017. https://www.envisionamerica.org/wp-content/uploads/2017/03/Robert-Wilhite-Navigant-EA-2017.pdf

[5] *Smart City Framework – Guide to establishing strategies for smart cities and communities*, PAS 181:2014, The British Standards Institution, February 2014. http://shop.bsigroup.com/upload/267775/PAS%20181%20(2014).pdf

[6] *The Smart City Opportunity for Utilities*, ScottMadden, Inc., May 2017. http://www.scottmadden.com/insight/the-smart-city-opportunity-for-utilities/

Generally, these statements also describe a "smart community" as used throughout this report. It is important to point out that smart communities are not one-size-fits-all. Just as a community's needs and priorities differ, smart community initiatives vary in size, strategy, and approach. In fact, the lack of a concrete definition – or a project checklist that determines whether communities are "smart" – affords communities the flexibility to become "smart" in different and innovative ways, and at their own pace.

Smart Community Attributes

Although they have distinct characteristics, smart communities share a key common thread – an emphasis on using technology and innovation to solve real problems and benefit citizens. Other more common (but not necessarily universal) smart community attributes include:

- **Smart & Connected.** Technological innovation and connectivity are providing a strong foundation for improved community services. For example, technological advancements have provided for smart meters, LED street lights, and environmental sensors, as well as communications infrastructure that facilitates better connectivity and the ability to monitor community resources.
- **Data-Driven.** Smart communities also are benefitting from opportunities associated with big data, particularly using data analytics to both visualize and address community needs (e.g., waste reduction) in a more timely manner (e.g., predictive maintenance).
- **Resilient.** According to 100 Resilient Cities, urban resilience is the "capacity of individuals, communities, institutions, businesses, and systems within a city to survive, adapt, and grow no matter what kinds of chronic stresses and acute shocks they experience."[7]
- **Sustainable.** Many communities are demonstrating a greater consciousness about precious resources and our environment. Efforts promoting more efficient energy and water use (e.g., net zero homes, water reuse piping), solid waste reduction (e.g., recycling), and clean energy options (e.g., renewables) are prevalent in smart communities.
- **Mobile.** Several communities also are exploring programs and technologies aimed at improving the overall driving experience by reducing traffic congestion (e.g., ride-share, real-time traffic control), increasing parking efficiency (e.g., real-time parking management, smart parking meters), and reducing vehicle emissions (e.g., transportation electrification), which also helps achieve sustainability goals.
- **Economically Competitive.** While economic development has long been a community focus, communities are recognizing that more people (particularly millennials and younger adults) are choosing to live, work, and invest in more modern, vibrant communities that offer broader opportunities and experiences.

"A smart city doesn't exist without big data management."
- Robert Graham, U.S. Department of Energy

An electric vehicle (EV) project alone does not render a community "smart." In fact, there is no single checklist of projects for identifying a smart community.

[7] 100 Resilient Cities website at http://www.100resilientcities.org/resilience#.

- **Inclusive.** Communities are making a concerted effort to ensure that vulnerable populations have access to the new technologies and improved services offered as part of smart community initiatives. Not only do they want to avoid increasing the digital divide, but they also want to decrease the gap and improve the lives of the underserved.

Smart Community Core Values

To connect with key ideas that are broadly applicable to the regulatory process, participants suggested framing the concept of smart communities around a set of core values that a smart community – or a smart community project – ideally should possess. The following examples are not intended to represent group consensus or to be a complete list of such core values; however, they are offered to provide a potential starting point for future regulatory policy discussions.

A smart community or smart community project should:	Be inclusive of underserved citizens. Have well-thought-out consumer protections. Protect basic constitutional rights to privacy. Be conscious of limited resources.

Smart Community Drivers

Smart community experts cite a range of driving forces behind their initiatives, many of which are listed below. Consistent with the common and overarching goal of solving real-world problems, these drivers tend to align closely with major issues that communities are confronting and hope to positively address. It is important to note that the key drivers for smart community endeavors are not static; rather, they are subject to change along with community priorities, funding prospects, political shifts, etc.

- **Rapid Urbanization.** According to the United Nation's *World Urbanization Prospects* report[8] issued in 2014, 81 percent of U.S. residents at that time lived in urban areas, and this will increase to 87 percent by 2050. This trend is placing pressure on existing city infrastructure and services – and driving a need for more. As changes are made to accommodate more citizens and their needs, it makes sense to take a more holistic view and consider "smart" investments that provide longer-term benefits and savings.
- **Technology, Innovation & Data.** Communities today have greater access to technology, innovation, unprecedented data, and a range of applications for managing and using that data. This is a game-changer, making it possible for communities to consider new and more cost-effective approaches for solving their biggest challenges, including making services more accessible to traditionally underserved citizens.
- **Aging Infrastructure.** There is general agreement that our country's infrastructure (whether energy, water, communications, or transportation) is aging and is in need of significant investment. In addition to the physical infrastructure investment needs, the Smart Cities Council has called for investment in the "digital layer that makes physical infrastructure smart."[9]

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[8] United Nations, Department of Economic and Social Affairs, Population Division (2014). *World Urbanization Prospects: The 2014 Revision*, Highlights (ST/ESA/SER.A/352). https://esa.un.org/unpd/wup/Publications/Files/WUP2014-Highlights.pdf

[9] *Smart Infrastructure Unlocks Equity and Prosperity for Our Cities and Towns*, Smart Cities Council, September 2016.

- **Economic Development.** There are jobs associated with investing in the physical and digital infrastructure necessary to create a smart community. As pointed out by the Duke University Center on Globalization, Governance & Competitiveness in a 2014 report, our country has been missing out on those opportunities. The report suggested that underinvestment in infrastructure costs the U.S. more than 900,000 jobs, including more than 97,000 American manufacturing jobs.[10] Also, smart communities offer opportunities for economic growth by attracting those businesses and residents who are looking for a more vibrant and connected place to locate. According to Navigant Research, global smart city revenue is expected to grow from $36.8 billion in 2016 to $88.7 billion by 2025.[11]
- **Safety & Security.** Communities are tasked with the important job of protecting citizens. Smart technologies are available to help prevent incidents from occurring (e.g., smart street lighting, air quality monitors) and also aid first responders when they do occur (e.g., vacant home fire detection, gunshot detection).
- **Environment & Sustainability.** Citizens often expect their communities to demonstrate environmental stewardship. This is a primary driver of a number of smart community projects already underway.
- **Resilience.** Communities are concerned about their ability to withstand the aforementioned stresses and shocks. They are looking for smart solutions that will, for example, help them protect vulnerable critical infrastructure from natural disasters and ensure an uninterrupted energy supply for water, wastewater, public safety, health, and other essential services.
- **Mobility & Access to Critical Services.** Along with rapid urbanization often comes increased traffic congestion. In addition, those outside the existing transportation infrastructure may lack access to critical services such as healthcare and childcare. Communities are employing smart technologies to improve traffic flow, better manage parking availability, and provide broader access to critical services. According to the Smart Cities Council, the smart transportation sector is the number-one source of smart city projects.[12]

> "Social equity is the centerpiece of a smart city."
> - Kim Zentz, Urbanova

- **Access to Technology.** Communities are trying to ensure that all residents have access to technology and the internet. For example, smart community initiatives may try to fill gaps where investment is lacking in economically disadvantaged areas.
- **Return on Investment.** Community budgets are constrained, and, as highlighted above, significant investment in physical and digital infrastructure is needed. While that may present financial challenges, communities should consider the expected return on smart infrastructure investment. The Smart Cities Council refers to the return that communities see on smart infrastructure investments as "a classic example of triple bottom line benefits, thanks to the impact such projects can have on people, on profits and on the planet. Or put another way, they contribute to the social, financial and environmental well-being of communities."[13]

[10] *Infrastructure Investment Creates American Jobs*, Duke University Center on Globalization, Governance & Competitiveness, October 2014. https://s.bsd.net/aamweb/main/page/file/9d937012edb12326c4_7vm62z7l5.pdf

[11] *Smart Cities*, Navigant Research, 2016: https://www.navigantresearch.com/research/smart-cities.

[12] *Smart Cities Readiness Guide*, Smart Cities Council, 2015.

[13] *Smart Infrastructure Unlocks Equity and Prosperity for Our Cities and Towns*, Smart Cities Council, September 2016.

REGULATORY POLICY NEXUS

Notably, several identified smart community drivers overlap with existing and emerging policy objectives for which the three core groups often have a significant role. In fact, many state regulators, consumer advocates, and energy companies have considerable experience with issues that are frequently included in smart community endeavors, particularly those involving grid modernization, clean energy, and customer energy solutions. To illustrate the nexus between smart community initiatives and these key regulatory policy issues, examples are provided below.

Grid Modernization

Connected community infrastructure projects often include the deployment of smart technologies, such as smart meters, street lighting, and sensors that are connected and monitored through community communication network infrastructure and that utilize state-of-the-art data analytics to provide wide-ranging community benefits. These include visualization of unmet community needs, implementation of predictive maintenance practices, resource waste reductions, and improved day-to-day operations. There are potential synergies with energy company grid modernization deployment efforts, such as communications infrastructure, and with goals, such as resiliency and protection of critical community infrastructure from both physical and cybersecurity perspectives. Efforts related to grid modernization include:

- Advanced metering infrastructure (AMI) and smart grid sensors and devices connected by robust communications and information technology (IT) infrastructure to accommodate future needs;
- Reliability and resiliency – smart grid, system hardening, microgrids for critical facilities and infrastructure; and
- Data privacy and cybersecurity.

Clean Energy

At the core of many smart community initiatives are strategies to address climate change and improve the air and water environmental conditions within communities. Communities have established aggressive climate action goals and need their host energy companies to contribute to meeting these objectives. Efforts related to clean energy include:

- Energy-efficiency programs (e.g., building energy efficiency);
- Renewable energy supply requirements (similar to corporate adoption of climate action goals and renewable procurement programs); and
- Energy-water nexus issues. (Efficient water use leads to less wastewater generation and, ultimately, to less energy required for water and wastewater pumping and treatment.)

Customer Energy Solutions

Transportation electrification and smart parking, street lights, and traffic signals are at the core of smart community mobility initiatives to address traffic congestion and vehicle emissions. Communities recognize that disadvantaged neighborhoods often have lower air quality than other neighborhoods. Energy company involvement is critical so that both grid and environmental benefits are realized as communities embrace transportation electrification strategies. Efforts related to customer energy solutions include:

- Innovative end-use application tariffs and programs for street lighting, traffic signals, and electric transportation charging;

- Distribution platform to enable smart charging for electric transportation and vehicle-to-grid benefits in the future; and
- Pilots and optional service offerings to test new applications and concepts.

Do you recognize these smart community projects?

To illustrate relevance, a participating expert shared the following non-exhaustive list of smart community projects. Other participants acknowledged that they are in some way addressing many of these items in their jurisdictions; however, many did not previously consider them to be smart community projects.

- Energy-Efficiency Upgrades
- Low-Income Neighborhood Energy Efficiency
- Commercial Building Efficiency
- Weatherization
- Multi-Year, Internet-of-Things (IoT) Strategy
- Rural Infrastructure Deployment
- Distributed Energy Generation
- Rooftop (or Private) Solar
- Microgrids
- Electrification
- EV Charging infrastructure
- Multi-Purpose Infrastructure For Mobility
- Resiliency Planning
- Advanced Metering Infrastructure
- Geographic Information System (GIS) Mapping
- Climate Action Plan
- Bill Assistance
- On-Bill Financing
- Web-Enabled Customer Feedback

The City of San Diego's David Graham, who presented at CCIF Summits 1 and 3, illustrated to participants that smart community projects are not all that mysterious.

ROLES OF CCIF PARTICIPANTS IN SMART INITIATIVES

For purposes of this report, we identify potential roles of state utility regulators, consumer advocates, and energy companies with respect to smart community initiatives. To be clear, communities are driving smart initiatives. Thus, the community role is the most important, but unlike the potential roles of the three core groups, the community role has been well-documented. CCIF aims to plow new ground by highlighting ways in which the three core groups may engage on these issues.

As evidenced by feedback from CCIF participants, engagement of state utility regulators, consumer advocates, and energy company representatives with smart community experts (mayors, city/town councils, county commissions, etc.) is valuable. Throughout the dialogue, the smart community experts gained rare insight into the regulatory perspective. Likewise, CCIF participants gained appreciation for what communities are aiming to accomplish with smart initiatives and how the regulatory community may be involved, despite initial inclinations to the contrary.

While specific roles pertaining to smart community initiatives will necessarily become clearer and evolve over time, the following memorializes some of the initial ideas discussed by summit participants pertaining to potential roles of energy companies as well as state utility regulators and consumer advocates.

Energy Company Roles

For a variety of reasons as described herein, energy companies have historically worked closely with communities. Collaboration on smart community initiatives, especially at the request of the community, seems to be a logical extension of their existing relationship.

Energy companies offer considerable expertise in a number of areas that are relevant to communities pursuing smart initiatives. These include infrastructure planning, project management, maintenance and service restoration, and capital acquisition and deployment. They are also well-versed in engaging with the community, including sharing information and eliciting feedback about infrastructure and maintenance projects.

Energy companies are natural partners for communities working to achieve public policy goals, particularly those concerning sustainability, mobility, upgrades to critical infrastructure, resilience, and economic development. Of course, the extent of an energy company's ability to contribute to specific policy objectives will vary from jurisdiction to jurisdiction.

In addition, communities are already large users of energy company services, particularly with respect to water, wastewater, storm water pumping, and other city and county facilities. Customers living, working, or running businesses in these communities also are major energy users and expect energy companies to provide more products and services to better meet their changing needs. Municipalities and counties also are political entities that can – and often do – convey community aspirations to energy companies and other service providers.

To meet the more distinct needs of urban environments, energy companies have historically provided different levels of service. Transmission and distribution lines are often placed underground, and there can be a higher degree of distribution service redundancy. For instance, electric network (mesh) topology may be used rather

than a radial distribution system. Finally, energy companies may provide specific tariff offerings for street lighting, traffic control signals, and municipal pumping.

Cities and counties are public service providers and maintain critical infrastructure, like energy companies, often in the same rights-of-way. In fact, participants discussed the benefits of coordination among communities, energy companies, and other service providers, especially to realize cost efficiencies associated with coordinated timing of maintenance and repair activities.

Energy companies' work with communities to support smart initiatives is consistent with their work with other major customers to meet their evolving needs. As highlighted in CCIF's 2016 report on "Consumer Solutions," the three core groups encourage energy companies to work with their military and national account customers on creative ideas to address their unique needs (e.g., clean energy goals) while avoiding detrimental impacts on other customers. Similarly, energy companies will want to keep these concerns in mind as they work with communities on smart initiatives.

According to a smart city official, "cities need strong utilities…and utilities need strong cities." Particularly because energy companies and communities face similar challenges (weather and climate risk; aging infrastructure; and customer uncertainties), there are opportunities to join forces to address them in constructive ways through smart community initiatives. Specifically, energy companies may participate as:

> "Cities need strong utilities…and utilities need strong cities."
>
> - Grant Ervin, City of Pittsburgh

- **Service providers.** The traditional customer-provider relationship appears to become even more important as communities seek energy companies' help in meeting their evolving needs associated with smart community initiatives. Smart community officials and experts expressed a desire to work more closely with energy companies on these initiatives and shared some project successes in which the energy company's involvement was instrumental.
- **Project partners.** Communities are exploring public-private partnerships as a way to invest in smart community infrastructure, and, given the substantial and relevant energy company expertise in many of the areas of interest, energy companies may serve as valuable project partners.
- **Collaborators or advisors.** Smart community experts repeatedly mentioned the benefits of cross-functional collaboration and dialogue with respect to smart community initiatives. Such dialogue with energy companies was noted as particularly valuable for the reasons covered above, and, while already taking place to varying degrees, smart community experts were clearly interested in expanding the dialogue.

State Utility Regulator & Consumer Advocate Roles

Participants from the state utility regulator and consumer advocate communities also explored their potential roles with respect to smart community projects, particularly those involving regulated energy companies. Specifically, they may participate in smart community initiatives as:

- **Adjudicators or advocates.** To the extent that energy companies seek regulatory approval for specific projects related to smart community initiatives, state utility regulators, consumer advocates, and other affected stakeholders would serve in their traditional roles in such adjudicatory proceedings (state utility regulators as decision-makers, consumer advocates as intervenors on behalf of customers, etc.).

- **Conveners or facilitators.** While the most appropriate form may differ depending on particular state commission rules, requirements, and practice, state utility regulators generally have the power to convene workshops or other types of proceedings in which they invite stakeholders (including community officials, subject matter experts, consumer advocates, energy companies, vendors, nonprofits, etc.) to brief them on topics and activities. This facilitates a more engaging dialogue than a formal adjudicatory process may afford. State utility regulators also may be able to encourage open lines of communication or serve as "honest brokers" among stakeholders.
- **Collaborators or advisors.** As noted previously, participants recognized the value of collaboration and dialogue with respect to smart community initiatives. Presumably, community officials and all three of the CCIF core groups would participate in such collaborative discussions, with possible exceptions related to utility regulators who are prohibited from discussing matters that may ultimately be presented to them for a decision. In those cases, however, commission staff may have greater flexibility to participate, and consumer advocates typically are free to meet with entities that may become parties in a commission proceeding. Consumer advocates can also provide valuable feedback to communities about how certain projects may be viewed under a public-interest lens.

  While concerns were expressed with respect to state utility regulators making statements (pro or con) regarding smart community endeavors outside of noticed proceedings, there may be circumstances (particularly when making general comments or following state commission action) in which certain state utility regulators are able to speak openly. They may also encourage or incent certain actions by energy companies, other stakeholders, or federal officials. A range of examples include suggesting meetings with community officials, filing comments on relevant issues at the federal level, and taking formal actions to allow or remove barriers to greater energy-company involvement in smart community initiatives. Consumer advocates also may be interested in publicly expressing views, as well as seeking actions by state utility regulators or federal policymakers with respect to smart community initiatives.

To the extent appropriate, CCIF participants encourage collaborative efforts that include state utility regulators (whether commissioners or commission staff), consumer advocates, and energy companies in smart community discussions. Ideally, dialogues will result in long-term benefits to every community member and energy customer.

At CCIF's Kickoff Forum in La Quinta, PG&E's Robert Kenney, TURN's Mark Toney, Michigan PSC Commissioner Norm Saari, Washington UTC Commissioner Ann Rendahl, and EEI's David Owens begin the dialogue about potential roles of the three core groups with respect to smart initiatives.

WHAT WE LEARNED

Key Takeaways

The following are some of the more notable takeaways from the informative and engaging dialogue among smart community experts and the three core groups at the three summits. While variations of these statements may have been made by several participants, these are not intended to represent group consensus.

The "Smart Community" Concept

- There are many different definitions of "smart city" (or "smart community") and many different deployment strategies. The focus should be on the outcomes and not the label.
- Successful smart community key ingredients include vision, collaboration, and declaration.
- Social equity is the centerpiece of a smart community. It must be inclusive of underserved communities.
- Smart community projects should be based on sustainability, reliability, and inclusivity.

Regulatory Policy Nexus

- Many state regulators, consumer advocates, and energy companies have considerable experience with smart community issues but are often unclear about which projects qualify as smart community projects.
- There is a clear nexus between smart community endeavors and key regulatory policy matters involving grid modernization, clean energy, and energy company service offerings.

Roles of CCIF Participants in Smart Initiatives

- Community leaders seek energy companies' involvement in smart community initiatives, citing their expertise in relevant areas. Community leaders also welcomed collaboration with state utility regulators and consumer advocates, and they found the CCIF summits to be a productive way to begin a valuable dialogue with the three core groups.
- Participants discussed potential roles for energy companies, as well as for state utility regulators and consumer advocates. Energy companies may participate in the more traditional role of service provider – and also as project partners, collaborators, or advisors. Similarly, state utility regulators and consumer advocates may serve in their more traditional roles as adjudicators or advocates in formal proceedings related to regulated company requests; however, they also may serve as conveners, facilitators, collaborators, or advisors.
- As additional smart investments are made, more education will be needed. The three core groups will likely have some role in providing important information to the public.
- Achieving smart communities' goals may call for reviewing and redefining the roles and responsibilities of energy companies, regulators, and consumer advocates – among others. New York's work on Reforming the Energy Vision (REV) was noted as an example of states examining revisions to the entire energy market.

> "You can't future-proof decisions."
>
> - David Graham, City of San Diego

Costs & Benefits

- Regulators recognize a role – and even a duty – to work with municipalities and other local governments, but expressed concerns about the potential for customers outside of a community to become the funding source for a particular smart community. In response, experts emphasized that they are not talking about placing all cost responsibilities on either the community or the energy company and its customers; rather, one city representative suggested that costs should be apportioned using the system by which we determine what is appropriate for the customer.
- Smart community projects must be cost-effective and present a business case as the price of entry. Communities must answer the question "for the sake of what?" If the endeavor is only focused on investing in new technology, a community should not undertake it.
- There are opportunities for coordination and collaboration toward a more holistic and synergistic approach among the different types of providers. There is a need to eliminate barriers to resource sharing.
- There is potential for energy, water, and other metered companies running on one network.

Other Takeaways

- Sensors are being used to gather shared data and provide access to smart community partners. In creating shared information platforms, the importance of establishing plans for data governance (who owns and controls data), and how to both share and secure the data effectively, were emphasized.
- Universities often serve as the R&D arm for smart community initiatives. Increased alignment of federal and state funding with applicable research helps address difficult questions about priorities, etc.
- Communities want to improve their operations. Energy companies have essential assets to make that job easier, but communities will move forward regardless of energy company participation. Companies should pay attention to what customers want and emerging trends, as there are opportunities.
- Energy companies are still learning about smart communities and about how they can help address their needs. Possibilities differ based on factors such as a company's service area and the community's location and size. It will take time to realize the full potential of smart communities, and sharing best practices is encouraged.

The City of Louisville's Chris Seidt, who presented at CCIF Summits 2 and 3, and NASUCA's David Springe, engaged with other smart city experts, state commissioners, consumer advocates, and energy company representatives in Pittsburgh.

Opportunities & Challenges

Opportunities	***Challenges***
▪ enhanced community services ▪ healthier citizens ▪ safer neighborhoods ▪ smarter infrastructure ▪ more sustainable environment ▪ stronger, growing economy ▪ better mobility and access to critical services ▪ improved well-being of disadvantaged citizens and bridging the digital divide ▪ added value through innovation ▪ improved coordination with grid modernization efforts ▪ better leveraging existing energy company assets on every home for communication ▪ more robust talented and engaged workforce ▪ more grants, private investment, and other funding sources ▪ enhanced technological and innovative solutions, including non-asset-based (the cloud, etc.) ▪ increased collaboration and partnerships among public and private entities ▪ increased interaction with citizens	▪ "smart city" label confusion ▪ outdated infrastructure ▪ connectivity and technology placement (e.g., small cells) on existing energy or communications company poles ▪ changing local government culture ▪ obsolescence of technology choices ▪ skilled workforce development and training for new technologies ▪ data management - privacy, liability, security, and cybersecurity issues ▪ evaluation, measurement & verification (EM&V) ▪ perpetuation of existing inequalities ▪ unintended consequences (e.g., LED lighting impact on skies, astronomy) ▪ cost and cost allocation (quantifying benefits and savings; least cost versus value) ▪ communication of benefits and opportunities, especially to those resistant to technology and change ▪ funding with limited community budgets ▪ mismatch between community footprint and regulated energy company service area ▪ barriers to energy company engagement (regulatory structure, competitive market rules, etc.)

FEATURED SMART COMMUNITY INITIATIVES & PROJECTS

COLUMBUS, OH

Goals

- Sustainable transportation
- Safety through technology
- Population mobility
- Economic opportunity
- Greenhouse gas emissions reduction

Timeline & Costs

In June, 2016, the Department of Transportation (DOT) announced that the City of Columbus won its Smart City Challenge. As the winner, Columbus will receive up to $40 million from DOT and up to $10 million from Paul G. Allen's Vulcan Inc. to supplement the $90 million that the City has already raised from other private partners to carry out its plan.

A four-year program, the DOT grant timeline is as follows:

- First 18 months: Design and engineering work
- 2018: Procurement and deployment
- 2019: Test all demonstration projects
- 2020: Report back to DOT

Key points about the Vulcan grant include:

- Three-year term
- Agreement signed in 2017, and programs are now getting under way
- Many of the programs based on consumer attitudes about infrastructure and customer behavior

KANSAS CITY, MO

Goals

- Improve citizen experience
- Improve delivery of city services

Timeline & Costs

The City's electric street car project began in May 2014, was completed fall 2015, and began carrying passengers on May 6, 2016. Wi-Fi upgrades to streetcars are being considered for

2017. The cost of the project is $102 million (with approximately $63 million from city bonds and $37 million from the federal government). Since its completion, the project has helped attract millennials and new businesses to the downtown, as well as $1.8 billion in new construction since 2013. Of that, $381 million has been directly attributed to the streetcar project. New area development includes the Hyatt Convention Hotel, the Power & Light Apartments, and the Lyric Theater.

LOUISVILLE, KY

Goals

- Sustainability
- Community & citizenship
- Mobility
- Economy & innovation
- Public safety

Timeline & Costs

- Phase I (FY 2017)
  - Build out enabling infrastructure
  - Build public-private partnership with utilities and key entities
  - Release Smart City Plan
- Phase II (FY 2018)
  - Deploy sensors
  - Update key technology policies
- Phase III (FY 2019)
  - Enable Autonomous Vehicle (AV) transport
  - Create an innovation district test-bed

PITTSBURGH, PA

Goals

- Improve air quality
- Increase population after severe loss due to collapse of steel industry
- Foster energy independence
- Improve traffic flow and safety

Timeline & Costs

Launched as an energy independence strategy and further defined in the City's 2016 grant application to the DOT, the Pittsburgh smart community plan is a multi-year effort across several energy districts (microgrid, combined heat & power, district energy) and transit corridors (EV and AV). Pittsburgh estimated a cost of $50

million in its DOT application, but the City emphasizes that is a very rough preliminary figure, given the scope of the project. The next step is feasibility and initial design studies for each possible microgrid. While precise timelines do not currently exist, full implementation is expected to take a decade or more. Some priority projects include:

- Street Light Replacement – The City recently released a Request for Information (RFI), to be used to create a Request for Proposal (RFP) in 2017.
- Traffic Signal Upgrades – The City initiated this program with the Pennsylvania Department of Transportation (PennDOT), and it began in 2016.
- Microgrid Piloting – Duquesne Light is currently in design for Woods Run Project.
- District Energy Expansion – NRG broke ground on a new steam production facility, and the owners of the 160-acre ALMONO brownfield site released an RFI for energy planning for a net zero real estate development.
- Fleet Transition to EV – The City just purchased its first EVs for its fleet and began the deployment of charging infrastructure. The City received a $250,000 grant from the Pennsylvania Department of Environmental Protection to accelerate the purchase of vehicles and zero emissions charging infrastructure.

SAN DIEGO, CA

Goals

- Improve the region's energy independence
- Empower consumers to use electric vehicles (EVs)
- Reduce greenhouse gas emissions
- Encourage economic growth

Timeline & Costs

- Began in 2012 with solar-to-EV project at the San Diego Zoo
- City goal to transition to 100 percent renewable energy by 2035
- 12 adaptive traffic lights with $60 million state grant; reduce travel time by 25 percent
- The City will upgrade 14,000 street lights and add 3,200 smart sensors in largest IoT platform in the world. The cost is $30 million, with scheduled completion in Fall 2018. The project will reduce energy use by 60 percent and cost $2.4 million annually.

SPOKANE, WA

Goals

- Healthier citizens
- Safer neighborhoods
- Smarter infrastructure
- More sustainable environment
- Stronger economy

Timeline & Costs

As a living laboratory focused on solutions for cities and communities that are scalable, replicable, and sustainable, the Urbanova collaboration started in 2014, and the founding partners invested in the long term. Initial projects include:

- Smart and Connected Street Lights Pilot (FY 2017) – Demonstrates how to design Urbanova's living laboratory while increasing energy efficiency and public safety, and assessing the role of air quality in healthy cities. Cost: Pilot costs shared by participating partners.
- Shared Energy Economy Model Pilot (2017-2020) – Demonstrates how sharing various energy assets can benefit both consumers and energy companies. Cost: $7 million.
- Grand Challenges Research Grant (2016-2021) – Builds research capacity with emphasis on human-centered systems and population health impacts. Cost: $1.5 million.

CONCLUSION

Objective Met

Approximately 75 state utility regulators, consumer advocates, energy company representatives, community leaders, and other smart community experts worked together to better understand the concept of smart communities and to begin an important dialogue on the key issues featured in this report. Recognizing that the report does not address all issues with respect to this expansive topic, it serves as a useful tool for additional dialogue and collaboration between community leaders, state utility regulators, consumer advocates, and energy company representatives.

Next Steps & Opportunities to Build on Dialogue

CCIF participants recognize that they have significantly more to learn about smart communities and more to explore through dialogue among the three core groups, particularly with respect to impacts on the relevant utility sectors, their customers, and the regulatory and policy arenas. Therefore, CCIF may initiate additional exploration of this topic in the future.

Special Recognition

The CCIF Executive and Advisory Committees would like to acknowledge the following individuals and organizations whose valuable contributions resulted in this report:

- NARUC, NASUCA, and EEI, particularly the guidance of their respective leaders and the valuable input and hard work of their respective teams;
- All participating state utility regulators, consumer advocates, and energy company representatives;
- All participating subject matter experts, including mayors, other city officials, consultants, and collaborative representatives; and
- All speakers, panelists, and attendees who participated in the November 2016 Kickoff Forum in La Quinta, California, where many of the issues addressed within this report were introduced.

As a result of the CCIF collaborative dialogue, participants representing the City of San Diego and the City of Louisville entered into a friendly competition to be the first to offer their citizens a Wi-Fi-enabled dog park. San Diego's Dog Park at Quartyard (with Wi-Fi) is featured at left.

APPENDIX

CCIF EVENTS ON CONNECTING COMMUNITIES

Fall Kickoff Forum

November 12, 2016

La Quinta Resort & Club

La Quinta, CA

Collocated with the NARUC and NASUCA Annual Meetings

Spring Summit 1

March 2-3, 2017

Manchester Grand Hyatt San Diego

San Diego, CA

Spring Summit 2

March 20-21, 2017

Kansas City Marriott Country Club Plaza

Kansas City, MO

Spring Summit 3

April 6-7, 2017

Hyatt Regency Pittsburgh International Airport

Pittsburgh, PA

Grant Ervin, Chief Resilience Officer for the City of Pittsburgh, engages with CCIF Summit 3 participants.

FEATURED EXPERTS

The 2016 Kickoff and 2017 Summits featured the following experts (in order of appearance), to whom CCIF owes gratitude:

- **Hon. Travis Kavulla**, Vice Chairman, Montana Public Service Commission
- **Mr. Russ Vanos**, VP, Sales & Marketing, Global Software, Services & Smart Cities, Itron, Inc.
- **Mr. Robert L. Graham**, Director, EV Everywhere Challenge, US Department of Energy
- **Mr. Jason Anderson**, President and CEO, Cleantech San Diego
- **Mr. Michael E. Britt**, Vice President, Energy Innovation Center, Southern Company
- **Mr. David K. Owens**, Executive Vice President, Business Operations Group & Regulatory Affairs, Edison Electric Institute
- **Hon. Ann Rendahl,** Commissioner, Washington Utilities and Transportation Commission
- **Hon. Norm Saari**, Commissioner, Michigan Public Service Commission
- **Dr. Mark W. Toney**, Executive Director, The Utility Reform Network (TURN)
- **Mr. Robert S. Kenney**, Vice President, CPUC Regulatory Relations, Pacific Gas & Electric Company
- **Mr. Robert A. Nelson**, Consumer Counsel, Montana Consumer Counsel
- **Mr. David Graham**, Deputy Chief Operating Officer - Neighborhood Services, City of San Diego, California
- **Ms. Kim Zentz**, Director, Urbanova, and Co-Director, Washington State University Smart Cities Initiative
- **Mr. Michael E. Champley**, Commissioner Emeritus, Hawaii Public Utilities Commission
- **Hon. Sly James**, Mayor, City of Kansas City, Missouri
- **Mr. Chris Seidt**, Civic Technology Manager, Department of IT, City of Louisville, Kentucky
- **Ms. Kate Garman**, Innovation Analyst, Office of Innovation, City of Kansas City, Missouri
- **Mr. Grant Ervin**, Chief Resilience Officer, City of Pittsburgh, Pennsylvania
- **Mr. Mark Patton**, Vice President, Smart Cities, Columbus Partnership

ACKNOWLEDGMENT OF 2017 SUMMIT PARTICIPANTS

Due to the nature of the collaborative process and the extensive degree of participation, statements within this report 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 *Connecting Communities*:

Ms. Tia Alexander
Kansas City Power & Light Company

Hon. Don M. Bailey
North Carolina Utilities Commission

Mr. Greg Bernosky
Arizona Public Service (APS)

Ms. April Bolduc
San Diego Gas & Electric

Mr. Greg Bollom
Madison Gas & Electric Company

Mr. Eric Borden
TURN-The Utility Reform Network

Mr. Michael Champley
Hawaii Public Utilities Commission Emeritus

Hon. Upendra Chivukula
New Jersey Board of Public Utilities

Hon. Maida Coleman
Missouri Public Service Commission

Ms. Courtney Cook
Utility Consumers' Action Network

Mr. Matthew Dority
Kansas City Power & Light Company

Ms. Laurie Duhan
Baltimore Gas & Electric Company

Mr. Bruce Edelston
Southern Company

Hon. Rachel Eubanks
Michigan Public Service Commission

Mr. John R. Evans
Pennsylvania Office of Small Business Advocate

Mr. Grant Ervin
City of Pittsburgh, Pennsylvania

Mr. Daniel Francis
American Electric Power (AEP)

Ms. Kate Garman
City of Kansas City, Missouri

Ms. Linda Gervais
Avista Utilities

Mr. David Graham
City of San Diego, California

Mr. Greg Greenwood
Westar Energy

Mr. Nick Singh Gumer
DC Office of People's Counsel

Mr. Brian Haines
San Diego Gas & Electric

Mr. Ed Hedges
Kansas City Power & Light Company

Hon. Sarah Hofmann
Vermont Public Service Board

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

Hon. Mike Huebsch
Public Service Commission of Wisconsin

Hon. Libby Jacobs
Iowa Utilities Board

Hon. Sly James
City of Kansas City, Missouri

Ms. Elizabeth Jones
Oregon Citizens' Utility Board

Ms. Elin Swanson Katz
Connecticut Office of Consumer Counsel

Mayor Sly James welcomed CCIF Summit 2 participants to Kansas City and spoke about the value of the city's smart initiatives to citizens.

Mr. Mike Kearney
Ameren

Ms. Charlene Ketchum
Missouri Public Service Commission

Ms. Rebecca Knox
Edison Electric Institute

Mr. David Kolata
Citizens Utility Board of Illinois

Ms. Jane Krikorian
Utility Consumers' Action Network

Ms. Shelby A. Linton-Keddie
Duquesne Light Company

Ms. Ivy Lyn
Edison Electric Institute

Ms. Natalia Mathura
Pepco Holdings International

Ms. Katrina McMurrian
Critical Consumer Issues Forum

Ms. Martha Legg Miller
Balch & Bingham LLP

Mr. Michael Moody
Michigan Department of Attorney General

Ms. Kristin Munsch
Citizens Utility Board of Illinois

Ms. Jennifer Murphy
NARUC

Mr. Stuart Nachmias
Con Edison

Hon. Chris Nelson
South Dakota Public Utilities Commission

Hon. Donna Nelson
Public Utility Commission of Texas

Mr. Robert Nelson
Montana Consumer Counsel

Mr. David Nickel
Kansas Citizens' Utility Ratepayer Board

Hon. Ellen Nowak
Public Service Commission of Wisconsin

Ms. Taren O'Connor
Connecticut Office of Consumer Counsel

Mr. David K. Owens
Edison Electric Institute

Hon. James Patterson
North Carolina Utilities Commission

Mr. Mark Patton
Columbus Partnership

Mr. Brad Ramsay
NARUC

Mr. Jesse Rodriguez
Exelon Corporation

Mr. Joseph Rosenthal
Connecticut Office of Consumer Counsel

Hon. Norm Saari
Michigan Public Service Commission

Mr. Mark Schuling
Iowa Office of Consumer Advocate

Mr. Chris Seidt
City of Louisville, Kentucky

Ms. Holly Rachel Smith
Exelon

Hon. Dianne Solomon
New Jersey Board of Public Utilities

Mr. David Springe
NASUCA

Ms. Elizabeth Stipnieks
Edison Electric Institute

Hon. Stephen Stoll
Missouri Public Service Commission

Mr. Rick Tempchin
Edison Electric Institute

Mr. Dave Thompson
Connecticut Office of Consumer Counsel

Dr. Mark Toney
TURN - The Utility Reform Network

Mr. Russ Vanos
Itron, Inc.

Hon. Nick Wagner
Iowa Utilities Board

Ms. Nicole Wehry
Kansas City Power & Light Company

Hon. Jordan White
Public Service Commission of Utah

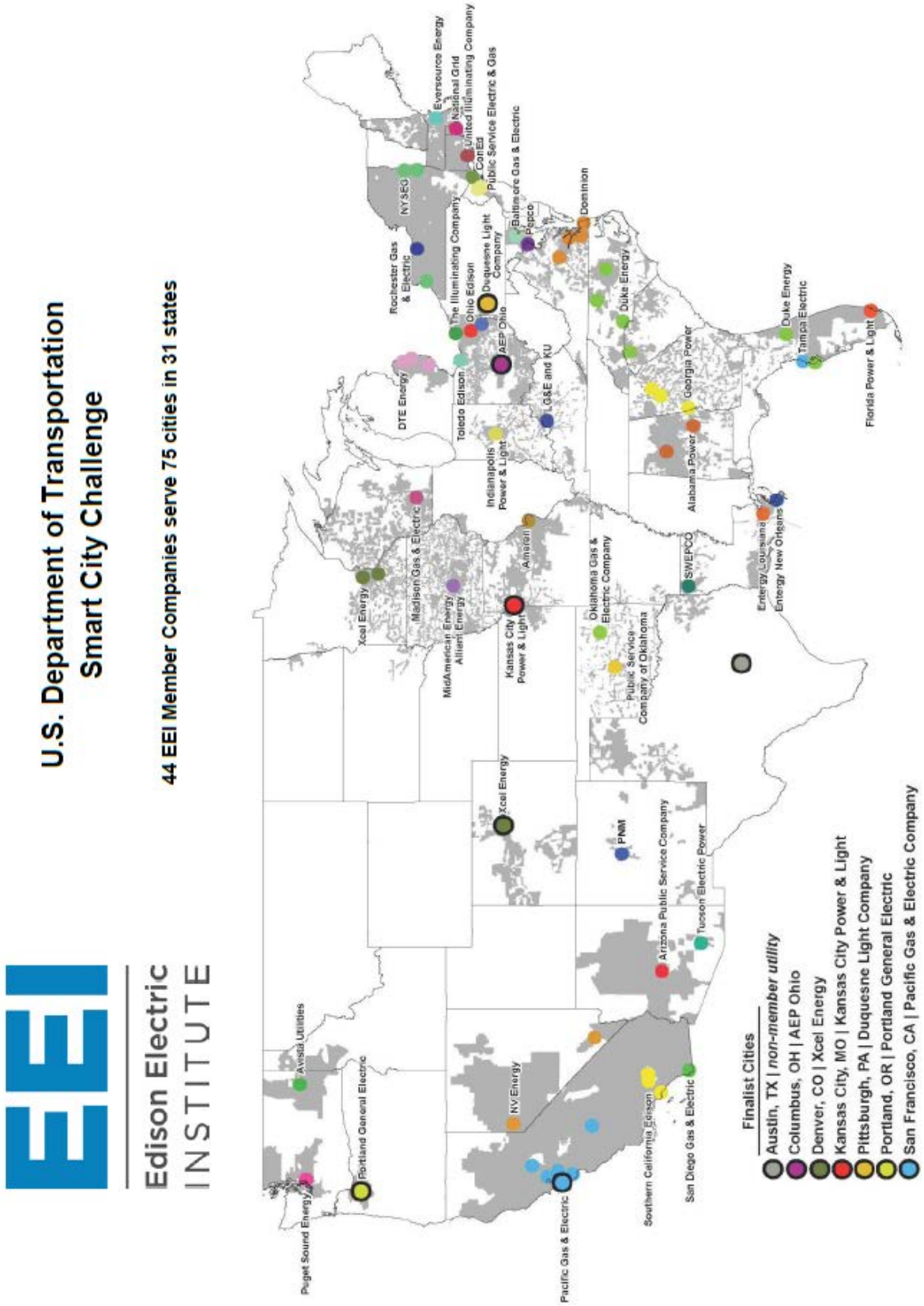
Mr. Hampton Williams
Missouri Office of Public Counsel

Mr. Jim Williams
Office of the Ohio Consumers' Counsel

Ms. Kim Zentz
Urbanova
Washington State University

*List represents individuals and their organizations at the time of participation in the summits.

MAP OF DOT SMART CITY CHALLENGE COMMUNITIES



Edison Electric Institute
701 Pennsylvania Avenue, NW
Washington, D.C. 20004-2696
202-508-5000 | www.eei.org

American Electric Power
- ***AEP Ohio***
  - Canton, OH
  - Columbus, OH*
- ***Public Service Company of Oklahoma***
  - Tulsa, OK
- ***SWEPCO***
  - Shreveport, LA

Alliant Energy
- Des Moines, IA

Ameren
- St. Louis, MO

Arizona Public Service Company
- Scottsdale, AZ

AVANGRID
- ***New York State Electric & Gas***
  - Albany/Schenectady/Troy/ Saratoga Springs, NY
  - Buffalo, NY
- ***Rochester Gas & Electric***
  - Rochester, NY
- ***The United Illuminating Company***
  - New Haven, CT

Avista Utilities
- Spokane, WA

Baltimore Gas & Electric Company
- Baltimore, MD

Berkshire Hathaway Energy
- ***MidAmerican Energy Company***
  - Des Moines, IA
- ***NV Energy***
  - Las Vegas, NV
  - Reno, NV

Consolidated Edison
- Yonkers/New Rochelle/ Mt. Vernon, NY

Dominion
- Newport News, VA
- Norfolk, VA
- Richmond, VA
- Virginia Beach, VA

DTE Energy Company
- Detroit, MI
- Port Huron/Marysville, MI

Duke Energy
- Charlotte, NC
- Greensboro, NC
- Greenville, SC
- Orlando, FL
- Raleigh, NC
- St. Petersburg, FL

Duquesne Light Company
- Pittsburgh, PA*

Entergy
- ***Entergy Louisiana***
  - Baton Rouge, LA
- ***Entergy New Orleans***
  - New Orleans, LA

Eversource Energy
- Boston, MA

FirstEnergy
- ***The Illuminating Company***
  - Cleveland, OH
- ***Ohio Edison***
  - Akron, OH
  - Canton, OH
- ***Toledo Edison***
  - Toledo, OH

Florida Power & Light Company
- Miami, FL

Indiana Power & Light Company
- Indianapolis, IN

Kansas City Power & Light Company
- Kansas City, MO*

LG&E and KU
- Louisville, KY

Madison Gas & Electric Company
- Madison, WI

National Grid
- Albany/Schenectady/Troy/ Saratoga Springs, NY
- Providence, RI

Oklahoma Gas & Electric Company
- Oklahoma City, OK
- Tulsa, OK

Pacific Gas & Electric Company
- Fremont, CA
- Fresno, CA
- Oakland, CA
- Sacramento, CA
- San Francisco, CA*
- San Jose, CA

Pepco
- Washington, DC

PNM
- Albuquerque, NM

Portland General Electric
- Portland, OR*

Public Service Electric & Gas Company
- Jersey City, NJ
- Newark, NJ

Puget Sound Energy
- Seattle, WA

San Diego Gas & Electric Company
- Chula Vista, CA
- Oceanside, CA

Southern California Edison
- Long Beach, CA
- Moreno Valley, CA
- Riverside, CA

Southern Company
- ***Alabama Power Company***
  - Birmingham, AL
  - Montgomery, AL
- ***Georgia Power Company***
  - Atlanta, GA
  - Brookhaven, GA
  - Columbus, GA

Tampa Electric
- Tampa, FL

Tucson Electric Power
- Tucson, AZ

Xcel Energy
- Denver, CO*
- Minneapolis/St. Paul, MN

Other applicant cities:
- Anchorage, AK
- Austin, TX*
- Chattanooga, TN
- Jacksonville, FL
- Lincoln, NE
- Lubbock, TX
- Memphis, TN
- Nashville, TN
- Omaha, NE
- Tallahassee, FL

**** Finalist City***

ADDITIONAL RESOURCES REGARDING SMART COMMUNITIES

Smart City Resources

- Smart Cities Council: http://www.smartcitiescouncil.com
- Itron 10 Tenets: http://marketing.itron.com/campaign/10-Tenets-Smart-City/10-Tenets-Smart-City.html
- Code for America: https://www.codeforamerica.org/
- Next City: https://nextcity.org
- Envision America: http://envisionamerica.org/
- MetroLab Network: http://metrolab.heinz.cmu.edu/
- 100 Resilient Cities: http://www.100resilientcities.org/
- Bloomberg Philanthropies What Works Cities: https://whatworkscities.bloomberg.org/
- Brookings Global Cities Initiative: The Exchange: https://www.brookings.edu/global-cities-initiative-the-exchange/

Featured Community Sites

- Columbus, Ohio
  - Smart Columbus: https://www.columbus.gov/smartcolumbus/
  - Columbus Partnership: http://www.columbuspartnership.com/
- Kansas City, Missouri
  - KCMO Smart City: http://kcmo.gov/smartcity/
  - KCMO Smart City Open Access: http://smartkcmo.xaqt.com/
- Louisville, Kentucky
  - Smart Louisville: https://louisvilleky.gov/government/smart-louisville
  - LouieLab: https://louisvilleky.gov/government/louielab
- Pittsburgh, Pennsylvania
  - SmartPGH: http://smartpittsburgh.org/
  - OnePGH: http://pittsburghpa.gov/onepgh/index.html
  - SmartPGH Consortium: http://smartpittsburgh.org/programs/smartpgh-consortium
- San Diego, California
  - San Diego Smart City: https://www.sandiego.gov/sustainability/smart-city
  - Cleantech San Diego: http://cleantechsandiego.org/
- Spokane, Washington
  - Spokane University District: http://www.spokaneudistrict.org/smart-city
  - Urbanova: www.urbanova.org

Community Associations

- United States Conference of Mayors: https://www.usmayors.org/
- Conference of Democratic Mayors: http://www.democraticmayors.org/
- Community Leaders of America: http://strongcommunityleaders.com/
- African American Mayors Association: https://www.usmayors.org/
- National League of Cities: http://www.nlc.org
- State Municipal Leagues: http://www.nlc.org/state-municipal-leagues
- National Association of Counties: http://www.naco.org
- State Associations of Counties: http://www.naco.org/about/committees-state-associations-and-affiliates (expand "State Associations" tab)

CCIF OVERVIEW

CCIF Formation, Leadership & Process

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. Current members are recognized on the next page and guide CCIF initiatives at each of the following steps in the process:

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 invitation-only 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.

CCIF Value & Successful Track Record

By providing a non-adversarial, collaborative environment in which participants from the three core groups can candidly discuss and proactively address a variety of energy issues with potentially broad impacts on electric consumers, CCIF has consistently produced credible reports that:

- Demonstrate support for key concepts to the broader stakeholder community;
- Demonstrate leadership of the three core groups on a range of energy topics;
- Initiate, inform or focus dialogue at the state level (regulatory and broader public policy dialogue); and
- Focus on consumer aspects of energy topics and facilitate proactive consumer education & protection.

Specifically, the following CCIF reports have contributed to the energy policy debate in a constructive way:

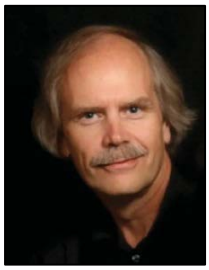
- *Grid Modernization Issues with a Focus on Consumers*, July 2011
- *Focus on The Regulatory Process*, July 2012
- *Policy Considerations Related to Distributed Energy Resources*, July 2013
- *DG: A Balanced Path Forward: Providing Customer Choice While Ensuring Reliability*, July 2014
- *The Evolving Distribution System: Helping Consumers Navigate Access to Products, Services and Technologies*, July 2015
- *Consumer Solutions: Meeting Consumer Needs on All Levels*, July 2016

All CCIF reports are available for download at www.CCIForum.com.

CCIF LEADERSHIP

Executive Committee

Greg R. White
NARUC Executive Director



Robert A. Nelson
Montana Consumer Counsel & NASUCA President

David K. Owens
EEI Executive VP of Business Operations & Regulatory Affairs

Advisory Committee

David W. Danner
Chairman
Washington Utilities and Transportation Commission

Libby Jacobs
Commissioner
Iowa Utilities Board

Ellen Nowak
Chair
Public Service Commission of Wisconsin

Elin Swanson Katz
Consumer Counsel
Connecticut Office of Consumer Counsel

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

Mark R. Schuling
Consumer Advocate
Iowa Office of Consumer Advocate

Gregory Bollom
Asst. VP—Energy Planning
Madison Gas & Electric Company

Wayne Harbaugh
VP of Pricing & Regulatory Services
Baltimore Gas & Electric Company

Phillip R. May
President & CEO
Entergy Louisiana

CCIF EXECUTIVE DIRECTOR

Katrina McMurrian
Executive Director
Critical Consumer Issues Forum

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Twitter: @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 utility regulators, consumer advocates, and energy companies – 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 (NWSC), an ad hoc organization representing the collective interests of member state utility regulators, state consumer advocates, state radiation control officials, state energy officials, tribal governments, local governments, electric utilities with operating and shutdown nuclear reactors, and other public and private sector experts on nuclear waste policy matters.

In these roles, McMurrian frequently interacts with Congress; Administration officials; state and federal utility regulators; state and national consumer organizations; industry representatives; and numerous other public and private stakeholders.

A Northwest Florida native, McMurrian received a Bachelor's degree in finance and an MBA from Florida State University. She and her husband currently reside near Nashville, Tennessee.

RECOGNITION OF DAVID K. OWENS

A proponent of CCIF since its inception, EEI's David K. Owens has been an integral part of the dialogue between state regulators, consumer advocates, and energy company representatives. "David has a knack for both sparking a little controversy as a moderator *and* resolving controversy as a participant in CCIF consensus-building efforts," said Katrina McMurrian. "He'll be greatly missed, and we thank him for his role in shaping something that has positively impacted the regulatory policy dialogue."

CCIF extends its sincere appreciation for David's leadership and support. He left a lasting mark on CCIF, and his participation has reinforced the spirit of "collaboration, not confrontation" as David himself described CCIF's objective.

CCIF

CRITICAL CONSUMER ISSUES FORUM

Save the Date for CCIF November 2017 Kickoff

Saturday, November 11, 2017 2:00–5:00 pm

Hilton Baltimore Baltimore, MD

Registration Registration will open at www.CCIForum.com in late August. There is no charge to participate, but a separate registration with CCIF is required. Please make your hotel reservations accordingly. Commissioners and consumer advocates will be eligible for 1-night hotel stipends but are responsible for making their own hotel reservations, including any additional nights to attend the forum.

For More Info Information about the forum will be posted at www.CCIForum.com. You may also contact Katrina McMurrian, CCIF Executive Director, by e-mail at: katrina@CCIForum.com or by phone at 615-905-1375.

This event is not sponsored by NARUC or NASUCA and is not a part of the agendas of the 129th NARUC Annual Meeting or 2017 NASUCA Annual Meeting.

CCIF

CRITICAL CONSUMER ISSUES FORUM

For more information about CCIF or this report:
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