Edison Electric INSTITUTE

Smart Cities Council

A Collaboration Playbook for Smart Cities and Electric Companies

An Executive Guide to Partnership Opportunities

Prepared by:

Edison Electric Institute and
Smart Cities Council

April 2019

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Smart Cities And Electric Companies Working Together Makes Sense

Smart grids and smart cities can change the world for the better. They go hand in hand. But far too many cities and electric companies are developing their programs in isolation. They are missing opportunities to work together that can create powerful synergies and cost efficiencies.

Taking advantage of collaborative opportunities can lead to millions of dollars in cost savings and improved results. This playbook passes along success stories, lessons learned, and best practices gleaned by the Edison Electric Institute (EEI) and the Smart Cities Council. This work was informed by three interactive summits in 2018, involving more than 100 experts representing electric companies, smart cities, and technology partners to uncover ways to better work together.

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Cities and Electric Companies: A Powerful Partnership

Why is the city-electric company connection so powerful? First, because electricity influences all aspects of our lives and economic activity, including economic development. Second, because city-electric company partnerships are the single biggest opportunity to make smart cities achievable by sharing infrastructure, costs, and data. Last, and most important, the partnership has the potential to make a positive impact and improve the quality of life for families and individuals.

Electric Companies

There's no better partner for a city than an electric company.

Infrastructure. In the last decade, electric companies have made significant investments in both physical assets and digital capabilities in order to make the energy grid smarter, stronger, cleaner, more dynamic, and more secure. These investments are opportunities to be leveraged by cities so that they can integrate more infrastructure systems in the future.

Experience. The electric power industry has a great deal of experience ensuring reliability while incorporating new technologies.. The industry was the first to install large area communications networks, sensors, and smart meters, and to learn how to gather, store, safeguard, and analyze massive quantities of data.

Stability. Electric companies want their cities to succeed. They are invested in the long-term well-being of their communities as anchor institutions with substantial physical infrastructure, local workforces, and stakeholder relationships. In addition, they are charged with maintaining security, reliability, affordability, and reliability for customers and citizens.

Cities

Cities, meanwhile, have much to offer electric companies.

Infrastructure. We're not just talking about roads and bridges. As more cities invest in smart city and public safety initiatives, they are making substantial investments in their networks, which connect many disparate systems.

Community. By their very nature, cities bring together diverse groups of stakeholders for a common good. They are adept at gathering feedback and working to build consensus among competing interests and viewpoints. Cities can bring together businesses, residents, and the electric companies that serve them in a way that no other entity can.

Purpose. Cities also are trying to meet their citizens' expectations for a sustainable, resilient, convenient and safe place to live — expectations that are becoming more challenging to meet as cities worldwide are housing an increasingly larger percentage of the world's population. Cities are motivated to partner to be able to do more with less.

Shared Goals and Opportunities

Cities are stepping up their investments in smart city initiatives for reasons ranging from economic development and quality of life to sustainability. Meanwhile, U.S. electric companies spend more than $100 billion annually on transmission and distribution infrastructure improvements for similar reasons. While cities and electric companies are making progress individually, they could unlock much more value by working together.

During an EEI workshop of electric company smart community leaders in 2018, attendees agreed that a driving factor was that current electric systems could provide additional value – such as cost-effective services and data. In addition, things like the physical wires, rights of ways, and the electric distribution system can serve as a real foundation for the beginning of a smart city.

Getting Started

How do you establish a long-term partnership focused on smart city initiatives? It's a combination of finding the right issue and the right people — and establishing solid, value-driven, long-term goals. Below are four ways to deliver lasting results that can help you build lasting, productive relationships.

1. Build a vision together

A strong, unifying vision can make an incredible difference in the long-term success of a partnership by delivering several key benefits:

- The collaborative visioning process leads to a shared goal.
- It also provides a strong foundation for making fundamental change.
- It gives participants a sense of purpose — something to move forward to and a sense of control over that goal.
- The collaborative visioning process fuels creative thinking and support for the shared goals.

The shared vision itself should have three key elements:

- A destination. What would a vision of success look like several years down the road? The vision should describe a highly desirable future state.
- A purpose. Why are we doing any of this? If you don't truly understand the purpose of the work, you won't be able to build a business case to do it.
- Guiding principles. Without values that inform and guide next steps, incredible visions can die and wither on the vine.

PARTNERSHIPS ARE PAYING OFF

Charlotte, NC-Duke Energy. Duke was a charter member of Envision Charlotte, the non-profit that has led a number of smart initiatives. The Center City program led to a 19-percent reduction in energy use in the downtown core, which has resulted in $26 million in aggregate savings to date.

Denver, CO-Xcel Energy. Xcel Energy's Energy Future Collaboration (EFC) is a community- and relationship-driven endeavor focused on being forward thinking for the electric company and the community it serves. The company has signed EFC Memorandums of Understandings ("MOUs") with eight diverse cities and towns across Colorado.

Portland, OR-Portland General Electric. Portland General Electric will partner with three cities and invest in advanced communication and energy grid capabilities to provide customers with more choice and control over their energy use and carbon footprint.

San Diego, CA-SDG&E. San Diego Gas & Electric is a core partner in Smart City San Diego, a public-private-non-profit collaboration to improve energy independence, empower electric vehicles, reduce emissions, and encourage economic growth.

One of the key factors in the strength of your overall vision is the quality of the stakeholder group you bring to craft it. It's imperative to bring together stakeholders representing a wide spectrum of the community. This is essential to developing a vision that provides community-wide benefits and can win broad support.

Look to see what other support might be available in the community. Universities often are willing to lend expertise or research assistance. As an example, the University of Alabama at Birmingham is the third major partner in Birmingham's smart cities initiative along with the city and Alabama Power. The perspective of large employers, groups representing businesses, and the technology sector are also helpful.

Consider bringing in a third-party that you both trust to serve as a convener. This can help accelerate the conversation while developing trust. In some places, such as in San Diego County, Charlotte, NC, Columbus, OH, and Spokane, WA, creating a non-profit entity that included cities, electric companies, universities, and businesses, offered a flexible and collaborative structure to accelerate smart, sustainable initiatives.

2. Find a starting point

It may help to identify a potential project as a starting point. We will cover potential projects in more detail later, but here are ideas to illustrate the possibilities.

Electric vehicle charging. Electric vehicle (EV) use is growing fast. More than 1 million EVs are already on U.S. roads, and the number is expected to double by early 2021 and reach more than 18 million by 2030. Much of the charging infrastructure needed to support the anticipated growth in EVs doesn't exist today. Cities and electric companies are natural partners. Cities need EV charging infrastructure to provide mobility options for their citizens and to address climate targets, and electric companies are obvious partners. Public EV charging infrastructure can reduce range anxiety for existing and potential EV customers.

Smart streetlights. Communities often deploy smart LED streetlights to save energy, but they also have lower maintenance costs and can be mounted with a host of connectivity, sensing, charging, and other smart applications to improve public safety and deliver additional community benefits. Smart street lights are both an opportunity to provide new services and a tool that can help with efficiency and sustainability goals.

Citywide communications networks. Cities and electric companies increasingly are driven by data. Costs can be reduced by partnering to build the robust data network needed. Two notable intersection points are the state and community movement to adopt next generation public safety networks, such as FirstNet, and electric company expansion of their own communications networks to enable energy grid modernization.

Resilience against disasters. As cities increasingly are dependent on digital systems, it's even more critical to have resilient electricity. There are opportunities for cities and electric companies to collaborate as communities look to find solutions to power disruptions.

Sustainability and clean energy plans. Whether for environmental or other reasons, there is increasing interest in renewables and clean energy. Working together, cities and electric companies can partner to turn that interest into a coordinated, cost-effective effort.

Reviving under-served neighborhoods. By partnering, cities and electric companies can offer services and plan improvements to advance areas or neighborhoods that traditionally have been left behind. That's not just good for the people who live and do business in those communities, a stronger economy benefits all citizens.

3. Identify champions

Successful, innovative projects don't happen by themselves. They are driven by dedicated, enterprising individuals who champion the initiatives. Building relationships with these champions is critical to move from talking about big ideas to actually seeing them through.

Cities that are making substantial investments in smart city initiatives likely have already created a smart cities program office or named a C-level executive — such as a Chief Innovation Officer — to oversee the efforts. Similarly, forward-thinking electric companies have created their own internal innovation teams to focus on smart city activities.

A lack of such a role or dedicated team, however, doesn't preclude the opportunity to foster a productive relationship. Even in smaller organizations, there are people who are motivated to innovate. In fact, even in organizations with dedicated offices, you may want to try to identify these innovators, as they can help socialize change.

Here are some key traits to look for:

Enthusiastic about change. This critical trait seems simple, but it's a bit more nuanced. Ideal champions aren't interested in change for change's sake. They want to make a positive difference. That means they are open to new ideas and feedback, but they also have a deep understanding of how their organization works, including its strengths and weaknesses. That combination allows them to see how to apply and tweak ideas for maximum impact. Further, they aren't afraid to take risks and can learn from all experiences.

Strong personal networks. Effective champions know how to interact across their organization and make connections with others. They also are people-focused. They know how to get the best out of everyone and have empathy for those who are affected by change. And, they aren't afraid to speak up.

Focus on solutions. Effective champions aren't crippled by obstacles. They aren't afraid to ask for help, and they don't waste effort making excuses or placing blame. They do what it takes to move forward.

Focus on 'us' — not themselves. Effective champions focus on the greater good, rather than concentrating on "what's in it for me." They look at the positive and are able to communicate successes in terms where everybody wins. They also have strong values — and they stand by those values, regardless of the situation.

4. Use quick wins to build momentum

Nobody gets excited about a stalled partnership, which is why it's important to deliver early wins. While working toward a big vision, look for small, quick steps that can be used to demonstrate progress and success.

- One quick win can be the creation of a memorandum of understanding (MOU) among stakeholders that formalizes the partnership and defines shared goals and guiding principles
- Another approach can be to concentrate first on a showcase area or innovation district. For instance, if connected streetlights are a city-wide vision, consider concentrating the efforts first in a very visible part of the city or an area with the greatest need. This showcase approach can deliver a visible early win that can be used to build support for continuing efforts.
- It's also imperative not to draw out the process. Make decisions and then adjust as necessary.
- Success often leads to more success. Try to find ways to deliver success quickly to build interest in and support for your partnership initiatives.

Critical Plays for Success

Think big, but start small. Visions that are overly broad can be obstacles in and of themselves. A vision that is too big can be overwhelming, which leads to inaction. Creating quick wins in the context of a long-term vision also helps build support and keep the community engaged.

During your visioning exercise, try to pinpoint the root causes of the shared issues you have identified and then concentrate your efforts on the highest-priority causes that you can impact. Brainstorm everything that has an impact on your chosen issue and identify specific areas that your partnership could address.

Be clear regarding responsibilities. The goal is not to eliminate all traces of ambiguity — that effort could paralyze any progress — but you should have the ownership of key responsibilities decided upfront. Who assumes the risk? Who gets the credit for success? Who is the public face of any initiative? The partnership will be healthier if these potentially thorny issues are resolved early on.

Establish a common language. While cities and electric companies may have common issues or goals, they don't necessarily use the same words to express them, especially since the business models under which they operate are different. A shared understanding comes from developing a shared language.

Out of the box is good. When thinking of partnerships, it is okay to go beyond our known and familiar partners. Additionally, don't feel boxed into geographic boundaries. Sometimes the project might need to be smaller – like a neighborhood or community – or larger. San Diego, Phoenix, and Raleigh/Charlotte are cities that are approaching smart from a broader geographic perspective, as ultimately the large community benefits versus just the "hub" city.

Plays for Long-term Success

Set a baseline. The ability to demonstrate progress will be helpful to drive long-term interest and support for your initiatives, but you only can do that if you can show where you started.

Work toward quantifiable goals. This is a natural extension from establishing a baseline. We're increasingly data-driven — and data-based decision making is one of the foundational elements of smart cities.

Set clear boundaries. While some innovative cities and electric companies say that "it's OK to fail," what does that really mean? Before launching any efforts, be clear on what the tolerance level is and what determines if an effort is successful or not.

Give the plan its own life. Change is inevitable, but cities pose a special challenge. Even if cities and their electric companies can agree on shared goals, both may have different needs in reaching them. Cities can be driven by election cycles and political change. One way to ensure that a project doesn't become a fleeting initiative is to formalize it. If you can find a way to codify the work or make it part of a department's mission, it allows the effort to continue even if the people change.

Turning Roadblocks into Building Blocks

A strong vision and a desire to see things through may not be enough to turn a plan into action. Innovators from cities, electric companies, and the technology industry identified critical areas that presented roadblocks to smart city development. During the 2018 Summit Series, the following best practices and suggestions were collected to identify ways to turn roadblocks into building blocks.

Modernize Regulation

One of the biggest obstacles that stands in the way of more collaborative efforts is regulation — both overall electric company regulation and also local franchise agreements. While the regulations were well-intentioned when they were written, what were once consumer protections are now potential barriers that result in inefficiency and waste.

How do you change regulations? Summit participants believe the opportunity lies within the value the initiatives provide. If regulations are standing in the way of clear, compelling value to the community, regulators and state and local lawmakers should take note.

Summit participants suggested cities and electric companies both need to talk to each other to agree on specific goals — goals that benefit both entities. Other key elements here are a local focus, clear solution sets, and tangible steps.

Once those goals are set, consider educating the public to help citizens see what's at stake and how they could benefit. It's easier to make change when there's a demand for change. That appetite for change is growing in areas where power is becoming more of an interactive resource, such as where customers have tools to better manage what they use and how much they pay. Citizens then can become allies in efforts to remove regulatory obstacles.

Another idea: consider a campaign to educate those who can change or influence regulations about the benefits of closer cooperation. Help them understand exactly what's at risk, what's getting in the way, and how they can play a beneficial role. For example, many electric companies seek regulatory approval for new projects, including smart cities. Having a community or city voice in that process through a letter of support or being on the record as a collaborator can be key for winning approval.

Finally, especially in the realm of local regulations, candid discussions between cities and electric companies may result in a new understanding that leads to more workable regulations.

Think Creatively to Overcome Financial Barriers

The working groups at the summits suggested that a critical shift in mindset is needed. While people usually start from the position of trying to come up with funding to launch something new, there is great potential in finding value in assets that you already have.

When it comes to trying to win new financing, the working group pointed out that it's easier to get financing when you can articulate clearly how the solution addresses real problems, such as promoting economic development, reducing crime, raising living conditions and so on.

Acquiring technology through a service model or perhaps a revenue-sharing agreement also may make sense. There are more funding mechanisms than ever before. Consider using RFPs that request business

model and financing innovation as well as technology innovation.

Do not overlook non-traditional funding sources, like grants. Initiatives that address environmental, social justice, or other such areas may be able to attract funding from foundations and other charitable organizations. A good example is Smart Columbus in which the City leveraged $50M in grant money from the U.S. Department of Transportation to attract more than $500M in local investment in technologies, research, etc.

Manage Data for Mutual Benefit

In order for communities to become smarter, they need data. Data is at the very heart of what it means to be a smart city. Beneficial city/electric company collaborations may result from sharing data with a clear purpose.

Before launching any data-sharing initiative, you should have discussions about what exactly you want to achieve. Be clear about your objectives, as simply sharing data will not necessarily lead you to them. Consider hosting a small, cross-functional working session where stakeholders from the city and electric company can work together to brainstorm an approach to use data effectively. This collaboration not only uncovers data types that you may not have considered, it allows you to use your resources more effectively so that you're not overburdened with data. More data is not necessarily better, especially if you have limited resources to comb through it.

It's imperative to define explicitly what data will be shared and how it will be used. Data governance and privacy policies also may be necessary.

It's also important to be a good partner, especially if you are the beneficiary of the data-sharing arrangement. Work with your partners so everyone understands the goals and intent of the data-sharing. This may help better identify what the needs are so that data sharing can be more efficient. Keep in mind that this can be a good opportunity to have university or non-profit partners help with analysis.

Improve Transparency and Alignment

To get everyone aligned, all of the stakeholders need to understand the value proposition and what's in it for them. It's important that everyone involved focuses on the desired outcome (and that it's defined as a specific objective). A cost-benefit analysis also needs to show that the investment of time and other resources is worthwhile to the community.

Summit participants also suggested that people try to step out of their own shoes and consider how other participating agencies see the project. Consider other perspectives, and truly try to understand someone's motivation for the project. But there are also limits, of course.

Jumpstart Your Community's Efforts

While smart cities constantly are evolving, these suggestions can help jumpstart smart community activities in your city. When cities and electric companies partner, they develop smarter city initiatives for the benefit of citizens and customers, alike. City and electric company collaborations will evolve and change as more smart cities take hold and we learn together.

Partnership Success Stories

Whether you are looking for inspiration or a potential starting point, here are seven proven areas where cities and electric companies have collaborated and their efforts already are delivering results.

	Opportunities	Success Stories
Guiding Principles	Thinking proactively to establish guiding principles that are shared areas of focus and agreement, including sustainability goals (such as emissions reductions and renewable energy objectives); economic development; and energy-related technology ("smart city" concepts) ▪ An MOU is executed between energy company and city. Then, the city and electric company create specific work plans that outline project objectives, including anticipated resources, timelines and measurement metrics.	Xcel Energy's Energy Future Collaboration (EFC) is a community- and relationship-driven endeavor focused on being forward thinking for the electric company. The company has signed EFC Memorandums of Understandings ("MOUs") with eight diverse cities and towns across Colorado, including: Alamosa, Breckenridge, Denver, Lakewood, Lone Tree, Louisville, Nederland, and Westminster. Although work plans still are being developed for some communities, the guiding principles have helped target specific areas of alignment beneficial to all.
Data Sharing	Cities and electric companies may have data that can help each other improve service or response. For instance, data sharing: ▪ Allows for a coordinated response; ▪ Gives both parties better information on potential hazards; ▪ Provides additional data points to help both parties optimize how they allocate resources.	Seattle City Light, which serves the Seattle, WA, metropolitan area, was the first electric company to adopt the Outage Data Initiative, a voluntary open standard for posting outage and restoration information to a central location — a standardized platform for data sharing for electric companies, emergency management agencies, and first responders. The effort provides emergency responders with a common view of widespread events, aiding their response.
Electric Vehicle Charging	The benefits from electric vehicle charging collaborations are numerous and include: ▪ Electric companies that partner with cities can gain access to high-traffic public spaces. ▪ Cities can accelerate deployment by tapping into the experience and resources of electric companies. ▪ Cities can remove barriers to charging siting, permitting, etc. ▪ Opportunity for public engagement events and ribbon cuttings	Portland General Electric, in partnership with 6 cities, including Hillsboro, OR, is building an EV charging hub in a major shopping center. In addition to providing greater convenience to EV owners, the highly-visible program will raise EV awareness, key to helping the city achieve its sustainability goals. Public charging stations also can help make EVs an option for those who live in shared spaces that don't provide charging capabilities..
Smart Streetlights	Smart streetlights can provide significant cost savings, as well as a platform for other smart cities services. ▪ LED streetlights typically last four times as long as traditional high-pressure lights and consume about half the energy. ▪ Streetlight networks can support multiple uses, including gathering environmental data and supporting wireless telecommunications — potential additional revenue streams.	The City of San Diego has made a major investment in smart streetlighting with over 3,000 and counting. As it is installs more, it is using them to monitor parking spots, listen for criminal activity, and check air quality, among other things. Urbanova, a smart cities living lab in Spokane, WA, provides another great example; its six founding partners include the city, the electric company (Avista), and Washington State University.

	Opportunities	Success Stories
Microgrids	Microgrids, essentially mini energy grids that can operate in conjunction with or independent of the primary energy grid, can deliver several benefits: ■ Using distributed energy resources (such as solar power) they can provide emergency backup power to critical areas. ■ Their ability to manage energy supply efficiently also can reduce electricity costs, support primary grid operations, and ease strain on the primary energy grid during times of peak demand.	The Blue Lake Rancheria, a Native American tribe in Northern California, is committed to sustainability and community resilience. Its microgrid, created in partnership with Pacific Gas & Electric, Idaho National Laboratory, Humboldt State University, and others provides uninterrupted power to six buildings, including an events facility and emergency shelter. The solar-plus-energy-storage microgrid also has contributed to a 40-percent reduction in energy use. The community continues to partner with PG&E, particularly in the area of demand-response programs.
Connected Kiosks	Connected kiosks are best known for providing free public Wi-Fi, smart phone charging, and navigation assistance, but they can do substantially more: ■ They can provide integrated trip planning services, including accepting payment for multi-modal trips. ■ Usage data can be an invaluable tool for urban planning, traffic management, and other applications. ■ They can help close the digital divide.	Louisville, KY, Duke Energy One and Smart City Media partnered on the Louisville CityPost network, a network of digital banners and connected kiosks. Through the effort, Duke extended its engineering project experience into new markets and solutions. The city benefitted by delivering enhanced citizen engagement and used the project to guide growth and improve services.
Building Energy Management	Buildings consume almost 40 percent of the energy generated in the U.S., which makes them a prime opportunity for collaboration efforts to conserve energy. ■ More effective conservation efforts help cities reach sustainability goals. ■ Reducing energy consumption during peak times can allow electric companies to meet demand without needing expensive investments in new power plants and energy grid upgrades. ■ Conservation programs can engage citizens to better their communities.	Minneapolis, MN, established a goal to reduce greenhouse gas emissions 80 percent by 2050 and is working with its electric companies — Xcel Energy and CenterPoint Energy — to achieve it. Their award-winning Clean Energy Partnership has served as a model for others. They have built a database of commercial energy use and combined with the energy companies' conservation to help them focus on underperforming areas. They also have invested in outreach to community representatives, commercial building owners, environmental groups, and others.

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The **Edison Electric Institute** (EEI) is the association that represents all U.S. investor-owned electric companies. Our members provide electricity for about 220 million Americans, and operate in all 50 states and the District of Columbia. As a whole, the electric power industry supports more than 7 million jobs in communities across the United States. In addition to our U.S. members, EEI has more than 65 international electric companies with operations in more than 90 countries, as International Members, and hundreds of industry suppliers and related organizations as Associate Members.

Organized in 1933, EEI provides public policy leadership, strategic business intelligence, and essential conferences and forums.

For more information, visit EEI's Web site at www.eei.org.

Smart
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The **Smart Cities Council** envisions a world where digital technology has been harnessed to improve livability, workability and sustainability. A leader in smart city education, the Council has worked with cities and states that are collectively home to more than 200 million people, including Austin, Dallas, Indianapolis, Illinois, Jaipur, Miami, New Delhi, Orlando, Philadelphia, Sydney, and many others. The work of the Council is supported by more than 120 partners and advisers who have contributed to more than 11,000 smart cities projects.

For more information, visit www.smartcitiescouncil.com.