

Powering the People

SMARTER ENERGY, SMARTER FUTURE

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Smart Cities, Smart Connections: Bob Rowe, President and CEO, Northwestern Energy leads a lively discussion with city, technology, and electric company leaders on the how and why of smart cities

Moderator: Bob Rowe, President and CEO, Northwestern Energy

Speakers: Bob Bennett, Chief Innovation Officer, City of Kansas City, Missouri
Scott Osterholt, Director, Grid Modernization and Risk Management, AEP Ohio
David Graham, Deputy Chief Operating Officer, San Diego, California
Mark de Vere White, President, Electricity, Itron

Smart cities as the next big thing!

Rowe: Now that much of the world has embraced the concept of sustainability, the smart cities or smart communities' movement looms as the "next big thing." With more and more people moving to cities, the need to meet their many needs - efficient transportation and lighting, essential public services, and economic growth - is crucial. Cities, electric companies, and tech companies all have key roles to play. How do we get from a community to a smart community? What are the biggest problems cities face today?

Graham: Rapid urbanization. Aging infrastructure. Climate change. And security. They are today's four horsemen of a metro apocalypse. And each of these urgent problems is landing right on the doorstep of city hall. Cities and counties across the country are facing challenges of biblical proportion.



Our infrastructure is not aging well. The American Society of Civil Engineers says the U.S. must invest \$3.6 trillion in infrastructure by 2020. But, instead of just catching up, we say let's look at replacing facilities with multi-platform, upgraded technology. Traditional assets can provide more benefits when they're all connected. For example, where should we be investing? In street lighting, for sure. In San Diego,

we knew that we'd go LED and that each unit would be wirelessly connected.

Rowe: Bob Bennett, what were the drivers for Kansas City?

Bennett: The need to use data effectively. There's nothing you can do to build a smart community without data. You can have lots of technology and new products. But until you start using data to transform community decision-making, you're not smart.

Kansas City has 4,000 sets of data in the city on any given day, but how do we pull it together and make sense of it? Our consultant Xaqt had an idea: "Let's pull these different data sets together in a single algorithm," We're trying to answer the next question - not just, "Are we doing the right things?" but, "Are we doing the right things *right*."

Another key for us is long-term relationships. We didn't contract with Cisco and Sprint for just a pilot project. The maintenance packages for their technologies are embedded in our contracts. We're funding them with 20-year bonds, so we could have a 20-year relationship with these companies - not the typical three- to five-year city contract.

An example of how to get more value from technology: Our new street lights dim or brighten depending on how many people their sensors see, saving us energy. They also count people and cars, so if someone wants to put in a cool coffee shop, we can identify spots with the most morning foot traffic.

Rowe: Scott Osterholt, how did Columbus win the U.S. Department of Transportation's Smart Cities Challenge over 77 other cities - cities like Austin and San Francisco - last year?

Osterholt: Rallying the Columbus community was a big factor. A good portion of that support, I'm pleased to say, came from American Electric Power (AEP). The strong commitment from AEP CEO Nick Akins, on down through the company, was key. Strong community backing was the only way we could compete.

The challenge for each of us, Osterholt said, is to think about what our city will look like in 15 years. Are there driverless electric vehicles everywhere? Are parking lots full of charging stations? Do the street lights talk to the city and the electric company? If a squirrel chews on a line and causes an outage, is your grid self-healing?



Also, USDOT and another grantor – Paul Allen’s Vulcan Foundation – wanted to know how much Columbus could decarbonize by boosting the adoption rate of electric vehicles. As a partial answer, AEP plans to roll out 1,275 electric vehicle charging stations, spread among residential and public locations, as well as a few DC fast chargers.

Rowe: David Graham, you’ve been on the smart city path for a while now in San Diego. What’s key to you in making wise investments?

Graham: Cities and the companies that work with them want to do planning that’s meaningful and forward-looking. Cities are moving away from pilot projects because they’re expensive and often don’t lead anywhere. We’re saying, if we’re going to invest, let’s at least use technology and data to create multi-purpose assets. That would be more efficient and transformative than what we’ve been doing.

Rowe: Mark White, I heard a factoid recently that there are 100 cities in China alone with over one million people. What’s driving this growing global interest in smart communities?

de Vere White: Consumers today expect information technology in every part of their lives. The Internet of Things (IoT) – the machine-to-machine learning, distributed intelligence network – is the biggest megatrend driving the electric power industry’s transformation.

Itron now has 150 million communicating, connected devices across the globe, making it one of the largest industrial internet companies. And, smart cities are at the top of our agenda. A good technology platform definitely helps. Itron’s platform offers a relatively good cost point, for example.

Collaboration between public and private sectors

Rowe: Sometimes it seems like the private sector is on Mars, the public sector on Venus. How can we get the deep collaboration between companies and governments that’s needed for these projects, from one generation to the next?

de Vere White: Like any successful partnership, you have to commit to shared goals. All parties have to see both the private and public benefits.

Graham: Well, let’s go in the opposite direction. Let’s look at the negative: “When smart cities go bad.”

We’ve all seen pilots or other projects that didn’t make sense – using proprietary technology and such. Smart city projects go bad when the motivation is wrong, when there are wrong partners, poor communication, an unrealistic impact assessment, and no exit ramp. You need to know when to say, “Sorry.”

Embedding the right thinking in all levels of your organization is crucial. Real transformation happens two and three layers down in an organization.

Osterholt: Another thing: A city doesn't have a regulator, so it can say, "We're going to do this" and do it. An investor-owned electric company like AEP can't really do that. We're often stuck in pilot mode. We need to be able to show our regulator that a project is valuable.

Graham: Yes, we can't forget that regulators are a critical part of this. We thought San Diego could deploy electric vehicle (EV) charging infrastructure in a particular way that worked for the city. But California regulators wouldn't let, San Diego Gas & Electric provide both the infrastructure and also the energy for the infrastructure. The city may decide to tell the regulators, "Hey, we really need this." The SDG&E "pilot" is actually 3,500 charging stations - a pretty big pilot. The city teaming up with the electric company makes sense.

Rowe: What's the business and regulatory model that allows this to go forward - both in the public sector and for the electric company and the technology company? How do you get both the business and regulatory model to allow something that everybody thinks is the "right thing to do" to move forward?

Osterholt: It's a challenge. AEP Ohio faced the issue with our smart grid business case and regulatory filing. We had to show how much benefit we would create for every dollar we spent. For a city, it may not be as clear. How do you monetize the benefits of a city microgrid, for example?

What about cyber security and privacy?

Rowe: How are cities approaching cyber security and privacy issues?

Graham: When we were doing our IoT deployment of streetlights, I asked the city's chief information security officer what he thought the biggest vulnerability was in our network. He said, "You." I said, "Me? What are you talking about?"

"It's city employees," he said. "It's humans. It's people. We're the biggest vulnerability in our cyber network. That dirty thumb drive that you put in and didn't think about. The nanny cam that you have at home that got hacked. That's often the biggest vulnerability."

Rowe: The electric power industry is very excited about the possibilities for smart cities and smart communities. As we've heard, there are many opportunities but also challenges. Thank you for giving us your unique perspective into how cities and communities are starting to realize some of the "smart" possibilities. And thanks for