



Information & Communication Technology Newsletter

EPRI Update on ICT Research from the Cyber Security and IntelliGrid Programs and Related Demonstrations November 2013

About the Newsletter

Dear Information & Communication Technology Stakeholders,
 As we near the end of 2013, EPRI researchers, engineers and scientists are working very hard to complete all the end of year research results and reports as most of them are due by the end of December.

This newsletter includes a few updates on research highlights and industry activities since the last newsletter and we will have another update summarizing key research results in January.

I encourage EPRI members to keep an eye on the EPRI website Cockpits as we are now beginning the steady stream of deliverables. Access the cockpits at www.epri.com and log-in. We've also added a new feature where you can sign up for weekly notices for any updates in our research projects.

Don't forget to register for the EPRI PDU Advisory meetings February 10-12 and Sector Council Meetings February 12-13.

Sincerely,
 Matt Wakefield
 Director, ICT
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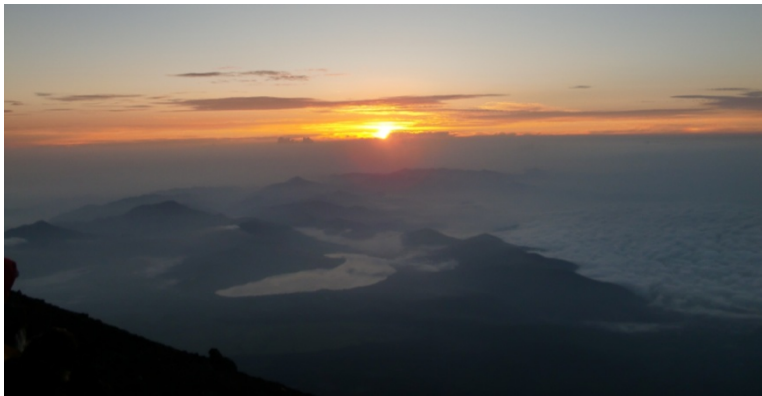
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EPRI ICT Team ^{with} Climb Mountain ~~for~~ TEPCO Leaders (Literally) by Matt Wakefield

As part of our international engagement with Tokyo Electric Power Company (TEPCO), we always try to exceed expectations – even climbing mountains. Members of the EPRI ICT Team meet annually in Japan to exchange research updates with TEPCO management and engineers. During the 2012 meeting, Tatsuya Kato from TEPCO shared pictures of his 2012 trip climbing Mount Fuji. Being the outdoorsman that Brian Seal is, he couldn't resist the temptation to make sure we had an opportunity to take a couple days of vacation to make the climb on our next visit (although I didn't think he was serious...).



Dr. Hideo Ishii, Matt Wakefield, Brian Seal, Tatsuya Kato at the base of Mt Fuji



And the next morning, we made it to the summit and caught a beautiful sunrise

In Japan, they say “a wise man will climb Mt Fuji once; a fool will climb Mt Fuji twice.” So I think I will check that off my “Bucket List,” and I didn't even realize it was on my list until Brian told me it was. It was a great experience to climb with Ishii-san and Kato-san and also timely because Mt Fuji was registered as a World Heritage Site by UNESCO in June 2013. We even talked a little “shop” – maybe we were getting light headed at that altitude (12,399 ft). During the following days, the workshop with TEPCO provided a fruitful two-way information exchange coordinated by our EPRI Resident Researcher from TEPCO, Dr. Shinya Sugita. Topics included their 27 Million Meter Smart Meter deployment, Cyber Security, Data Analytics and Standards (OpenADR, ECHONET), with a NIST SGIP update from Don Von Dollen.



EPRI's tracking and outreach efforts and associated research reflect its continued commitment to support the power industry in the identification of cyber security and privacy issues in the electric sector. The following adapted excerpts are from the most recent "[Cyber Security and Privacy Industry Tracking Newsletter – October 2013](#)" available to members of EPRI's Cyber Security research program. For more information, contact Galen Rasche, Technical Executive and Program Manager of the Cyber Security Program. grasche@epri.com.

Department of Energy (DOE) – DE-FOA-0000797: Innovation for Increasing Cyber Security for Energy Delivery Systems

DE-FOA-0000797 was issued by DOE on March 3, 2013. "...to perform research, development, and demonstrations of tools and technologies that will enhance the cybersecurity of energy delivery control systems in the US. This includes electricity generation, transmission and distribution... This also includes tools and technologies to assist in the compliance with North American Electric Reliability Corporation-Critical Infrastructure Protection (NERC-CIP) requirements for cybersecurity. Solutions should be interoperable, scalable, cost-effective advanced tools and technologies that do not impede critical energy delivery functions..."

On September 19, 2013 the announcement of 11 project awards was made that totaled \$30,671,073 in DOE funding with an additional \$12,757,645 in funding from cost share provided by the awardees. The awardees and a description of their projects can be found on the [energy.gov website](#) including an award to EPRI on Secure Policy Based Configuration Framework (PBCONF)

Secure Policy-Based Configuration Framework (PBCONF)

EPRI has been selected by the DOE, under DE-FOA-0000797 (Topic Area 4 – Secure remote access for the energy sector), to lead a team in developing a framework that allows utilities to centrally manage the remote configuration of their respective energy delivery system devices. The other members of the team include the University of Illinois, Schweitzer Engineering Laboratories, and Ameren.

The proposed project will develop an extensible, policy-based configuration framework to support the secure configuration and remote access of modern and legacy devices from a variety of vendors. The system will leverage distributed architecture concepts to support both centralized and peer-based configuration of the devices to support scalability and resiliency.

Cyber and Physical Incidents Panel Session

The newly formed ICT Sector Council met in person for the first time, following EPRI's September Advisory Meeting in Baltimore. This meeting included a panel session on cyber and physical incidents, which opened with Annabelle Lee discussing the National Electric Sector Cybersecurity Organization Resource's ([NESCOR's failure scenarios](#)) and mitigation strategies. She started this discussion by noting that most incidents are accidental rather than malicious. She discussed that there were over 100 scenarios with over 450 mitigations and covering six domains:

- Advanced Metering Infrastructure (AMI)
- Distributed Energy Resources (DER)
- Wide Area Monitoring Protection And Control (WAMPAC)
- Electric Transportation (ET)
- Demand Response (DR)
- Distribution Grid Management (DGM)

In the same session, Michael Daniel, Special Assistant to the President and Cybersecurity Coordinator also spoke on [Executive Order \(EO\) 13636](#). Michael provided background information and stated that cyber issues continue to grow broader as more and different devices are connected to networks. He also discussed the growing attack landscape, noting that malware is increasing in sophistication.

Defcon 2013 - Do-It-Yourself Cellular Intrusion Detection System (CIDS)

At Defcon 2013, held August 1- 4, a group of researchers, lead by LMG Security, demonstrated a CIDS used in testing cellular phones for malware. A [whitepaper](#) documenting this research was released in July of 2013. The result of the research showed that:

"... a low-cost CIDS can effectively be used to detect and respond to smartphone malware infections that traverse the cellular network, without requiring installation of any software on the smartphone itself. By making local cellular network traffic visible to everyday security professionals and researchers, we can reverse a critical asymmetry between attack and defense capabilities, and give defenders tools for detecting and preventing mobile malware cheaply and effectively."

NIST Cyber Security Framework Workshop

NIST held their fourth of four planned Cyber Security Framework Workshops at the University of Texas at Dallas (UTD) on September 11 – 13, 2013. Prior to the workshop, NIST released a "Discussion Draft of the Preliminary Cybersecurity Framework." This draft included results from the previous three workshops and serves as the first publicly available release. Utilizing existing industry standards and best practices, the Framework will support improvements to cybersecurity for the Nation's Critical Infrastructure. Progress on the Framework was made during the workshop at UTD and a number of issues held over from the previous workshop were addressed. However, it is important to note that there are still aspects of the Framework on which consensus has not been reached. Because of these open issues and NIST's shutdown, the October 10 requirement for the Framework to be added to the Federal Registry was missed, a requirement of Executive Order 13636.



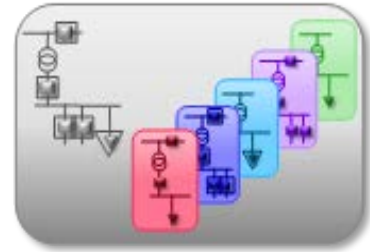
EPRI's IntelliGrid program conducts research, development and demonstrations on the information and communication technologies that enable grid modernization applications. Research areas include interoperability, communications, data management and analysis and smart grid implementation and planning. The following adapted excerpts are from the most recent [IntelliGrid newsletter](#). For more information, contact Don Von Dollen, Senior Program Manager of the IntelliGrid program (dvondoll@epri.com)

New Paper Identifies Potential Applications for AMI Systems

EPRI Report "Mapping Applications to Advanced Metering Infrastructure Capabilities" [Report ID: 3002001098](#) documents more than 80 applications that can be enabled by advanced metering. A disruptive innovation is defined as something that improves a product or service in ways that the market does not expect. Advanced metering infrastructure (AMI) easily meets this definition. It didn't take long for smart people within the utilities that had implemented simple automated meter reading systems to start thinking of new ways to use these systems. Outage management and theft detection were some early applications. As technology advanced and new capabilities were built into the advanced metering systems, new applications that would make use of the system or data were postulated. This report documents applications that have been deployed at some level within utilities even though not all are in full production. For more information, please contact [Don Von Dollen](#) at (650) 855-2210.

Centralized Transmission Network Model Management

Multiple applications within the transmission utility make use of electrical system network models. In today's utility, these models are typically maintained independently for each application, with variations of the same data manually entered into each application's database. Engineers often spend significant amounts of time entering, synchronizing, validating, and correcting duplicate information instead of actually doing system engineering. Gathering and staging the historic model and system state information needed for post-event analysis is often so time-consuming as to impact the timeliness of the results.



The Common Information Model (CIM) provides a basis on which a coordinated network model maintenance strategy can be built. The CIM is a high-quality, normalized model covering the information of interest to electric utility operations. EPRI is currently working with the operations, planning and protection groups in several major transmission utilities involved in the Integrated Network Model Management supplemental project to better understand the nature of their existing network model information flows and to design a CIM-based solution approach.

The Integrated Network Model Management supplemental project, which qualifies for EPRI "self-directed funding," is still open to additional participants. For more information contact [Pat Brown](#) at (913) 449-0736.

EPRI Interoperable AMI Workshop

The Interoperable AMI Roadmap project started with a focus group of utility personnel with AMI expertise from ten utilities. The group helped establish the framework and direction, and defined an initial set of value statements. An Interoperable AMI Workshop was held October 9-10, 2013 in Charleston, SC, in conjunction with EEI, AEIC, and ANSI meetings. Sixteen people from a diverse group of utilities participated. The value statements were reviewed and clarified, and the participants provided a prioritization in terms of ultimate value and timeframe. Building on this input from utility participants, the roadmap defined in this update will guide ongoing engagement with standards bodies and industry alliances, where we expect much of the new development will take place. Several related reports will be published by the end of the year, so members should be sure to monitor the EPRI website Cockpits for updates. For more information, contact [Tim Godfrey](#), (913) 706-3777

Augmented Reality Update

Anyone who has watched a football game on television in the last decade is familiar with augmented reality (AR). One of the first uses of AR was the projection of the first down and scrimmage lines onto the television image of American football to enhance the viewer's perception of the game. With the advent of smart phones and other smart devices, AR apps help with everything from finding restaurants to finding stars.



While the concept of AR has been around for several decades, it is only within the last few years that that the technology has become practical for everyday or commercial use (in terms of weight, battery life, cost, etc.). Currently, EPRI research is looking at the impact of this technology in four areas:

1. Visualization – providing valuable, real time or historical information to workers within the context of their environment.
2. Education and training – bringing institutional knowledge and skills to the worker.
3. Work flow – smoothing workflow by integrating data and application interfaces into the visual context of the worker.
4. Testing – providing data or visualizations of desired results to the worker performing the tests.



For more information contact [John Simmins](#) at (865) 218-8110.

Consumer Electronics Association Standard CEA-2045 Consideration as International Standard

In October 2013, the ANSI/CEA-2045 standard was approved for consideration as an international standard by the International Standards Organization ISO/IEC JTC-1. EPRI and several utilities have been involved in research related to this standard, including early requirements gathering, concept laboratory evaluations, and (presently) field demonstrations.

The standard defines a plug/port for end-use devices for the purpose of demand response (DR). The port makes the products Grid/DR-Ready by enabling them to work with any communication system through the use of consumer-installable communication modules.

A modular approach has broad international appeal, with examples of related work being done in Australia, Europe, and Japan. In recent action by the ISO/IEC JTC-1, a "New Work Item" was approved, focused on considering the ANSI/CEA-2045 as an international standard. The JTC-1 has 34 participating countries. The approval required that a majority of the participants support the work, and at least 5 countries commit to actively contributing.

This is the beginning of the process, not the end, and there are several steps ahead in the path toward an international standard. EPRI sees value in international standardization in general and is working to coordinate with other organizations working in this space. EPRI will continue to provide updates to members as this activity progresses. If you have further questions, please contact Brian Seal at bseal@epri.com, (865) 218-8181.



Enterprise Architecture (EA) Interest Group

In the last quarter the Enterprise Architecture Interest Group webcasts have covered every aspect that the group has been chartered to accomplish: utility presentations on their enterprise architecture practices, tools and techniques, and developing reusable artifacts.

For tools and techniques, the series on using ArchiMate 2.0 was concluded in the June webcast with an examination of Implementation and Migration extension to ArchiMate. In the July webcast James Horstman from Southern California Edison (SCE) presented on their EA practices. The SCE EA journey included moving from a single enterprise architect in 2004, to multiple enterprise architects, project architects, and technology strategists. This occurred as the enterprise architecture practice began to show value for the organization--compensating for early efforts when SCE faced more projects than available architects. SCE is now keeping in front of the demand, and establishing metrics.

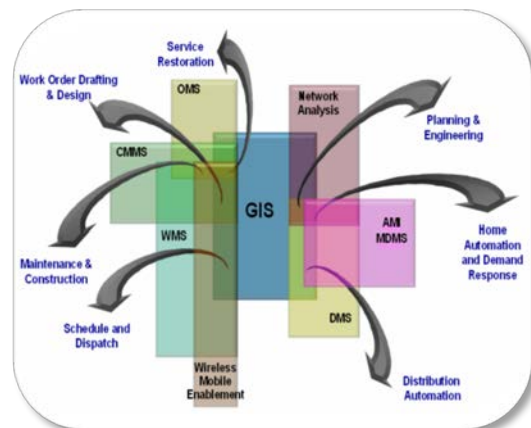
Finally, the August webcast was used to develop an EA Risk Assessment form to address "When should the EA team be engaged on a project?" This spoke to the idea that not all projects require EA attention. There might be low risk, small projects that already comply with the organizations architecture standards. For these types of projects the need might be merely to add this project to the enterprise repository. For larger, higher risk projects, there might be a need to engage an enterprise architect on a full-time basis, with multiple review phases. To help guide the decision by determining a risk score, a matrix was created that includes variables such as dollars, time, scope, and standards compliance. . This score can be used to determine the appropriate level of EA governance that needs to be applied, based on any given organizations risk sensitivity. Webcasts are available at the [Enterprise Architecture Interest Group resource site](#). For more information, or to join the Enterprise Architecture Interest Group, please contact [Dr. Gerald R. Gray](#) at (865) 218-8113.

Geospatial Information Systems (GIS) Interest Group

Grid modernization is dramatically changing the way we deliver electrical energy. What has historically been a uni-directional flow of energy from generation to customer is now increasingly paralleled with a bi-directional communication network to optimize the use and flow of electricity. The intelligence of the future grid is fundamentally reliant on geospatial data to represent and track numerous devices' location within the connected model of the distribution system. A GIS fills this role, and as a result, it has become increasingly important to understand the data exchange between the GIS and other modern grid systems.

Although the full-featured grid modernization may be a distant goal for many utilities, an accurate representation of the electric grid is a must. GIS is a vital component of a utility's central data store and is the ultimate driver behind the grid modernization framework whose systems together provide the connected model on which the grid relies. Quality GIS is crucial to leveraging grid modernization investments and realizing its full potential.

GIS is no longer a novel technology for utilities. It has been in place for two decades at some utilities and is entering its third generation of functionality. The mystique of GIS is long gone and it is viewed as another enterprise system. Despite this, the role and importance of GIS data has evolved with the advent of grid modernization.





EPRI publishes “communications updates” that highlight issues of relevance to utility communications engineers and managers. The focus is on developments in communication technologies, standards and business issues that affect the design, deployment or operation of utility communications infrastructure. The following adapted excerpts are from the Field Area Network (FAN) Demonstration (Demo) and the most recent [Smart Grid Communications Intelligence](#) newsletter available to IntelliGrid program members. For more information, contact Tim Godfrey, Senior Program Manager, Communications at tgodfrey@epri.com.

FAN Demo Program Update

EPRI has launched the Field Area Network (FAN) Demonstration program. The project members include utilities in various stages of FAN development, from technology selection to full deployment of a FAN. The project will also raise the level of industry knowledge and practice around FAN reliability by publishing the results of FAN trials supported by the project. In particular, research will be published on high-reliability FAN architecture, design principles, guidelines for implementation and operation.

The design and implementation of a FAN involves many competing variables and decisions. There is a complex interaction between network technology options, private, public, and hybrid networks, spectrum choices, the set of supported applications, and the overall system cost/benefit analysis. The Field Area Network Demo is a collaborative research program that quantifies these relationships and demonstrates how the optimum solution can be achieved.

The members of the FAN Demo include Salt River Project, Duke Energy, Hydro One, United Illuminating, Great River Energy, Nebraska Public Power District, and Hydro Quebec. Two member meetings were held in May 2013 and September 2013. The next member meeting is scheduled for March 4-5, 2014.

EPRI Hosts WiGRID Interoperability Certification Plugfest

EPRI hosted the WiMAX Forum’s Smart Energy Working Group for the first WiGRID Certification Plugfest in Knoxville, October 28-30. The WiMAX Forum® is an industry-led, not-for-profit organization that certifies and promotes the compatibility and interoperability of broadband wireless products based upon IEEE Standard 802.16. The Smart Energy Working Group focuses on applications for WiMAX in the electricity, oil, and gas markets. The WiGRID Certification verifies interoperability by testing interoperability and conformance to the WiGRID Profile, which specifies tests based on use cases that are relevant to the energy markets. One example of a WiGRID test is the verification of end-to-end communication of GOOSE messages from protection relays within a specified latency. The GOOSE message testing system was developed at EPRI’s Substation Lab in Knoxville. The first WiGRID Plugfest was hosted by BC Hydro in October 2012. Working with the Smart Energy Working Group and participating in the WiGRID Plugfest aligns with one of the goals of EPRI’s Field Area Network Demo, which is to support interoperability testing between vendors offering standards-based broadband wireless equipment.



IEEE 802.24 Smart Grid Technical Advisory Group (TAG)

The 802.24 Technical Advisory Group provides coordination across the multiple Working Groups that are developing standards related to the Smart Grid. A TAG is a peer to a Working Group in terms of the 802 organization, but does not develop standards. The other TAG operating in IEEE 802 is 802.18, which deals with Radio Regulatory issues. The [802.24 web page](#) provides more information.

In the July meeting, the 802.24 TAG worked with the 802.18 TAG to the somewhat controversial issue of using the wireless spectrum for utility purposes, quantification of the necessary data rates, and explanation of why utility use of wireless communications will not cause interference to existing wireless services. Because of the interest and concerns surrounding this issue, the IEEE802 will take great care in developing a response that will likely point out the widespread successful application of wireless standards and technologies in the smart grid, using both licensed and unlicensed bands.

The 802.24 TAG is also starting the development of a white paper to highlight the application of IEEE 802 standards in a variety of smart grid applications. This white paper is complementary to the package of standards that was developed previously. The package presents a set of IEEE 802 standards and describes potential smart grid applications that each could support. The white paper is starting with a broader set of smart grid applications, and highlighting the IEEE 802 standards that are appropriate for the applications.

Update on the Wi-SUN Alliance

The Wi-SUN Alliance was formed in early April 2012. This Alliance “will establish a system to certify the connectivity and interoperability” of devices built to the 802.15.4g standard. The Alliance conducted its third interoperability event in May 2013, and its fourth event in August 2013. At the events, interoperability was demonstrated and AMI products were tested over 802.15.4g. Member companies Analog Devices, Cisco, EDIC Systems, Murata, NICT, Procubed and Silver Spring Networks all provided products for the testing. At the fourth interoperability event, the full conformance and interoperability test suites were executed. The Wi-SUN Alliance expects to be able to offer certifications in the near future.

To achieve fully interoperable advanced metering infrastructure (AMI), standards must exist at every layer, but there are currently no standards at the application layer. The Wi-SUN Alliance may be an appropriate organization to develop these standards for AMI, and EPRI is working with their leadership to determine the feasibility and timetable for this effort. EPRI is developing a roadmap for interoperability in AMI systems focused on the utility value proposition. This project is part of the IntelliGrid 161D project set. The project will coordinate with the Wi-SUN Alliance, as well as other industry organizations, in support of the overall goal of more interoperable AMI.



EPRI's multiyear international demonstrations identify and analyze data-oriented applications and support infrastructure through collaborative demonstrations around the world. The following adapted excerpts are from the most recent newsletter from the Distribution Modernization Demonstration (DMD) and Transmission Modernization Demonstration (TMD) on data analytics. For more information on the DMD, contact Doug Dorr, Program Manager for the DMD (ddorr@epri.com) or Dr. Alberto Del Rosso, Senior Project Manager for the TMD (adelrosso@epri.com).

EPRI to Coordinate Advanced Electric Grid Monitoring and Control Initiative

EPRI will coordinate the community meetings of the North American SynchroPhasor Initiative (NASPI) through 2015. NASPI is a collaborative effort among the U.S. Department of Energy (DOE), EPRI, and North American electric utilities, vendors, consultants, federal and private researchers and academics.

Since the establishment of NASPI in 2006, DOE and the North American Electric Reliability Corporation (NERC) have funded NASPI meetings and work. Beginning in January 2014, DOE will take over the principal funding role and EPRI will work with NASPI as its meeting coordinator.

NASPI's mission is to improve power system reliability and visibility through wide-area measurement and control. It is a collaborative working to advance the deployment and use of networked phasor measurement devices, phasor data-sharing, applications development and use, and research and analysis. Synchrophasor data applications include wide-area monitoring, real-time operations, power system planning, and forensic analysis of grid disturbances. NASPI's focus for the next two years will be advancing applications to maximize value from the technology and this particular effort is very well aligned with the Transmission Modernization Demonstration and other related research at EPRI.

NASPI has contributed to the successful design and deployment of synchrophasor systems, developed numerous technical interoperability standards relating to phasor measurement unit capabilities and data communications, advanced the breadth and capabilities of synchrophasor data applications, and worked to gain public appreciation for the value of the technology for grid operations.

Establishing Frameworks for Utility Analytics

As the utility industry moves forward with data analytics projects, there is clear need to get its collective arms around the topic of data governance to insure that every data driven project has measurable corporate value and can be tied back to core company values and/or strategic objectives. In this area of development, several approaches to utility data analytics are being pursued and no single answer fits every situation.

As part of EPRI's data analytics research in the DMD and TMD, a report in progress will be delivered in the first quarter of 2014 that will consider several organizational models that may be adapted by organizations. These models will help organizations to progress up 5 (five) maturity levels in relation to their information development competencies. This resource will consider formation of cross-cutting Data Analytics Centers of Excellence in the electric utility industry that can apply to existing and forward looking levels of maturity at 5 different stages: 1) Aware, 2) Reactive, 3) Proactive, 4) Managed, and 5) Optimal.

Big Data Insights from Utility Analytics Week

In September 2013 EPRI sponsored two workshops at the second annual Utility Analytics Week Conference in Atlanta, GA. This conference is organized by Energy Central Magazine – and run by their wholly owned subsidiary the “Utility Analytics Institute” or UAI. While the conference had a very diverse selection of topics, the following sections describe some of the key outcomes from the EPRI workshops as well as the utility case studies from the conference. DMD and TMD project members can get copies of the EPRI presentations and materials by request from the respective program managers.

Utility Analytics Week Topic 1: Recapping the EPRI Roadmapping Session

Approximately 70 electric service providers attended the EPRI analytics road mapping session on Monday, September 23, 2013. Simply stated, the goal of the EPRI Data Analytics Research Initiative (DMD and TMD) is to support and accelerate the electric utility industry's transition to new value from data, and from “data driven” management objectives.

The objectives of the session were to obtain the input and vision necessary to align EPRI research and the demonstrations around the most important analytics needs and challenges for the electric utility industry. An initial observation was that a challenge of data analytics is that it may involve literally dozens of sub topics with respect to data acquisition hardware, storage, queries, data volume, standards, governance, data source integration, time dependencies, system bandwidth and so on. With this challenge in mind, it is important to begin the Data Analytics Research Initiative with such workshops and industry forums in order to objectively glean a solid understanding of the core dimensions of analytics – where a collaborative research model can make a positive impact for the electric power industry by the year 2020.

The full results of the roadmapping session will be aggregated with input and insights from EPRI's other 2013 venues such as the October 23rd Data Analytics Workshop in Boston MA, and these workshop insights will be published as a DMD TMD member deliverable. The following are just a few interesting quotes and session topical recaps:

Why are you here at the workshop and attending UAWWeek?

- *“We are interested in understanding where others are going and progressing with respect to establishment and outcome from their Data Centers of Excellence”*
- *“We have the data, but we want to see if we can get insights to get better at predictive analytics.”*
- *“We want the enterprise to consider the data an asset and learn how to make money from it.”*

Where do you see the greatest “Opportunities and Challenges” in this space?

- *“A big challenge is leveraging the data to use it so it is valuable. You must have a data champion in your department that understands how the data is valuable to more than just their group.”*

- *“Field (or wide area) visualization is a big opportunity. For example situational awareness before during and after storm events would be very valuable.”*
- *“A challenge (for our company) is in getting the value out of the data – this starts with getting the data out of the hands of IT and into the hands of people who can really leverage that value.”*
- *“Getting the data into the (innovators hands) can be a big challenge. We have great people, but it is not always easy to get through the system. There are lots of “data jails”.*
- *“Traditionally IT is on one side and OT on the other – but the view is changing. Getting to the last mile is still tough. Data must be considered an asset for all organization to work together to go that last mile,”*

EPRI Data Analytics “Immersion” with TMD and DMD Member Utilities

EPRI continues to schedule and conduct Big Data immersions with each of the DMD and TMD project sponsors. The objectives of these workshops are to:

1. Identify those unique data-oriented applications and kernels of knowledge that are useful and insightful but have not yet become commonplace within the utility industry as a whole.
2. Establish a baseline for each project member to use as their relative metric in terms of how prepared they are (or will be in a few years) to take advantage of the data analytics applications.
3. Identify the best in class and best practices for managing data as an asset and document the state-of-the-art related to data analytics and visualization.

Once all workshops have been completed, the data-related demonstrations phase of the DMD and TMD projects will commence. Some insights from these workshops are emerging and will help to shape the DMD and TMD research over time. A top ten list of some of the emerging findings and interesting quotes:

1. There continues to be an underlying concern that there is more data being collected than there is value derived from that data. Getting value out of various data sources is therefore a timely and important objective regarding data analytics collaboration across the electric power industry.
2. Integration of disparate data sets and getting data out of silo's is a major undertaking that has not been well resolved by the industry just yet. This is not unexpected as most data collection has traditionally been departmentally funded and as such that department tends to own and protect their data.
3. Many of the data analytics efforts outside of smart meters are at the pilot stage and not fully deployed. While we don't have an exact number, the majority of the (value from analytics efforts) to date are centered on AMI data.
4. Some utilities are making a concerted effort to reinvent the role and integration of their IT groups. Some have brought in IT management with experience in the banking and data center industries where “big-secure-data” and “streaming analytics” is not a new concept. They bring perspectives on big data and understand the importance of data governance.
5. There continue to be hurdles with getting the (analytics area of the electric service business) funded. This is a twofold issue, first because many analytics projects and efforts to date involve point solutions for point problems, and secondly because of staffing and budget constraints.
6. Many utilities purport their programs and analytics capabilities to be much further along than they really are. This space is changing quickly but in general, a lot of the analytics are in the pilot demo stages.
7. Some utilities are successfully implementing secure cloud solutions for data cost management. These are again, point solutions and don't yet traverse the enterprise.
8. Many utilities are grappling with the questions around ownership of analytics and applications – Most clearly believe this ownership should be across business units and not residing in IT for example. IT should own and maintain the platforms, tools security etc. but the corporate buy in and ownership is an area where best practices for utility analytics must be vetted.
9. Data Governance – Many believe this should be a corporate function and not an IT function so that any point solutions can ultimately get mapped to the corporate smart grid business plans and feed/support the longer range (Smart Grid 2020) vision.
10. Value Streams – At the end of the day, every data set and every data analytics project must stand on its own, based on the value it brings to the enterprise.

Overall, this top ten list, along with the many other notable insights gleaned from the “input of many,” provides us with a roadmap for utility system analytics and demonstrations moving forward.



SMART GRID DEMONSTRATIONS

The EPRI Smart Grid Demonstration Initiative is a seven-year collaborative research effort focused on design, implementation and assessment of prevalent challenges with integrating all types of Distributed Energy Resources (DER). Additional information is available in www.smartgrid.epri.com or contact Gale Horst at ghorst@epri.com.

Highlights from the Most Recent Smart Grid Demonstration Newsletter

[Smart Grid Demonstration Newsletter](#)

The September / October newsletter had several key updates including:

- Key “Takeaways” from 9 case studies from the 5-year update report
- An updated on Sacramento Municipal Utility District's (SMUD) project
- Highlights from the June Smart Grid Demonstration Meeting hosted by Commonwealth Edison
- Preview of the October Smart Grid Demonstration Meeting hosted by Hydro Quebec
- Video Preview of the Smart Inverter Training DVD
- Summary of recent deliverables

Utility Smart Grid Website and EPRI Animation

Hawaiian Electric Company (HECO)

Learn about the status of smart grid development in Hawaii at the [HECO Smart Grid webpage](#). There is also a link to a webpage on the Maui Smart Grid Demonstration Project, www.mauismartgrid.com. With Maui as the site of the March 18-20, 2014 Smart Grid Advisory Meeting, advisors may want to check the webpage in advance of the meeting for the Maui Smart Grid Newsletter on project status, and to view an overview video.

EPRI Animation on Time-of-Use Pricing

An animation entitled "Time-Based Electricity Pricing for Customers" has been produced by EPRI to help customers understand how time-based electricity pricing can help reduce the need for building additional power generation. The 3:18 minute animation can be viewed on YouTube at http://www.youtube.com/watch?v=T7_g76WUvc0&feature=youtu.be/.



KEY DATES

November 21-22, 2013, CaFFEET'13 – How Can Big Data Boost Society's Resilience?, Palo Alto CA

CaFFEET – the California France Forum on Energy Efficiency Technologies is hosting their annual workshop at Stanford University with this year's theme on How Can Big Data Boost Society's Resilience? Matt Wakefield, Director of Information Communication Technology is contributing on the organizing committee and also presenting. More information can be found here: <http://caffeet.org/conference-synopsis>

February 10-12, 2014, EPRI Power Delivery & Utilization (PDU) Advisors Meeting, Huntington Beach CA

The EPRI Power Delivery and Utilization Advisory Councils review the progress of ongoing research within their respective collaborative R&D programs. For ICT Stakeholders, the two key programs of interest are the Cyber Security and Privacy Program (P183) and the IntelliGrid Program (P161). Utility advisors are encouraged to participate in these twice-a-year meetings as a benefit of your EPRI membership. This event will open for registration in December, 2013. For more information, contact Ashley Eldredge at aeldredge@epri.com, (650) 855-2063.

February 12-13, 2014, EPRI Power Delivery & Utilization (PDU) Sector Council Meeting, Huntington Beach CA

The PDU Sector Council advises EPRI management and staff on the technical content, strategic planning and future direction of the PDU research portfolio. Sector Councils are comprised of executives from member companies by invitation of the Sector Vice President. This will be the second meeting of the ICT Sector Council currently made up of 23 CIO's and Security/IT leaders. [Click here](#) for more info.

March 18-20, 2014, Smart Grid Demonstration Advisory Meeting

Meeting is hosted by Hawaiian Electric Company (HECO) on Maui. The general sessions will include utility smart grid project updates, discussions, and presentations on focus areas in accordance with directives selected at the October 2013 advisory meeting. Attendees will have the opportunity to tour several of the HECO smart grid project sites. Attendance by members of the Smart Grid Demonstration Initiative is encouraged.

June 17-19, 2014, 2014 EPRI Resiliency Research Summit, Stockbridge MA

This event will feature presentations, live testing and group discussions on various aspects related to distribution system resiliency, including damage prevention, easier repair, isolation and reconfiguration, recovery and community sustainability. In addition to research updates and current findings, this event will feature live demonstration and evaluation of ongoing tests related to EPRI's Distribution Grid Resiliency Initiative encompassing Aerial Structure Hardening, Vegetation Management, Undergrounding, Grid Modernization, and Practices for Storm Response. There will also be discussion on the implications of research and current findings related to Prioritization of Resiliency Investments.

July 14-17 EPRI Smart Distribution and Power Quality Conference and Exhibition, Charlotte, NC

SAVE THE DATE, invitations coming shortly. EPRI and Duke Energy (Duke) invite you to the 2014 EPRI Smart Distribution and Power Quality Conference and Exhibition supported by EPRI Programs: Power Quality, Distribution, IntelliGrid and Cyber Security. This meeting will be at the EPRI Charlotte facilities. The conference will focus on how utilities are defining the future of the grid by addressing the challenges of today. The conference will provide a forum for electric power end users, distribution engineers and project managers, reliability and power quality (PQ) professionals, and related technology manufacturers to gather, share experiences, and learn from one another in a collaborative environment.

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