



Information & Communication Technology Newsletter

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

July 2013

ABOUT THE NEWSLETTER

Welcome to the Inaugural Information & Communication Technology (ICT) Newsletter which presents insights from EPRI's ICT research projects as well as industry updates. ICT continues to grow in importance in the electric utility industry as recognized in the EPRI CIO (Chief Information Officer) workshop that was hosted by DTE in November of 2012. The publicly available report [EPRI CIO Outlook 2012](#) helps document why this is a critical area of research, and presents CIO perspectives, including what they consider as today's key challenges: Cyber Security, Big Data and IT/OT Convergence.

Although EPRI has conducted ICT related research for many years, in January of this year, EPRI formalized its importance in the EPRI research program by making ICT the fourth "pillar" of our Power Delivery and Utilization (PDU) research alongside Transmission, Distribution and Energy Utilization Research. To support ICT research, I have built a team of over 25 professionals focused on ICT and Cyber Security and we have made significant investments in lab resources – our Substation Cyber Security Laboratory and the Smart Grid Integration Laboratory, both based in Knoxville, TN. These labs are interconnected with our other labs in Charlotte, NC and Lennox, MA.

In addition, for the first time, we have formed an ICT Executive Committee as part of EPRI's PDU Sector Council led by Mark McGranaghan, Vice President of PDU. This committee provides executive level engagement to EPRI in the Cyber Security and IntelliGrid programs as well as related demonstrations. The CIO community has enthusiastically embraced this effort and in a short time, 23 CIO's and senior IT/Security leaders have committed to be on this committee. The ICT Committee is having its first face-to-face meeting at the EPRI Sector Council meeting in Baltimore on September 11-12, 2013.

The content from this newsletter is primarily made up from recent updates across our ICT research areas, but doesn't necessarily capture the breadth of all the work we are doing. EPRI members can access detailed information in our "[Member Center](#)" and find additional information on our research portfolios at the following links:

[Cyber Security & Research Program \(P183\)](#)

[IntelliGrid Program \(P161\)](#)

Additional public Information on related research, newsletters, interest groups and more, visit: www.smartgrid.epri.com

I hope you find this information valuable and if you have any questions about the newsletter or our related programs, please contact me.

Sincerely,

Matt Wakefield

Director, Information & Communication Technology, mwakefield@epri.com, 865-218-8087

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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 excerpts are from the most recent "[Cyber Security and Privacy Industry Tracking Newsletter](#)" 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.

Security Standards

IEEE C37.240 Draft Standard for Cyber Security Requirements for Substation Automation, Protection and Control Systems

On May 3rd of 2013, the comment period for IEEE draft standard PC37.240 [1], version 13, was closed. This draft standard titled: [Draft Standard for Cyber Security Requirements for Substation Automation, Protection and Control Systems](#) is jointly sponsored by the Power Relay Systems Committee (PSRC) [2] through the H13 Working Group (WG) and the Substations Committees under WG C10. Key topics addressed in IEEE C37.240 include:

- Requirements for system security architecture with common network components and communication links
- Remote IED access systems including several sections defining the role of a Remote IED Access Gateway (RIAG)
- Connection Monitoring Authority (CMA) & Connection Controlling Authority (CCA)
- User authentication and authorization, data in motion protection and device configuration management.
- Security event auditing and analysis and security testing.

IEEE 1686 Standard for Intelligent Electronic Devices (IEDs) Cyber Security Capabilities

Draft 14 of the IEEE standard P1686 [8] is entitled: [Standard for Intelligent Electronic Devices \(IEDs\) Cyber Security Capabilities](#) was made available for voting in April of 2013, through the IEEE Standards Association. The release marked the beginning of recirculation ballot #1 and addressed comments during the initial balloting period. The period for the recirculation ballot #1 ended on May 5, 2013.

One of the more significant changes to this release was a broadening of the standard's scope from the more narrow "Substation IEDs" to include all IEDs.

Government

NIST Cyber Security Framework Workshop

The second NIST Cyber Security Framework Workshop was held at Carnegie Mellon University in Pittsburgh, PA from May 29 - 31. This was the second of four planned meetings sponsored by NIST and falling under the guidance established in Executive Order 13636. The third meeting was recently held July 10–12 at the University of California at San Diego. Initial input for the NIST Cyber Security Framework Workshop held at Carnegie Mellon University was collected in the form of a Request For Information (RFI) to gather relevant input from industry and other stakeholders, and to encourage stakeholder participation in the "Cybersecurity Framework" development process. Responses to the RFI ranged from individuals to large corporations and trade associations. All of the RFI responses are available [here](#).

Electric Grid Vulnerability – Industry Responses Reveal Security Gaps

In January of 2013, Representatives Edward J. Markey and Henry A. Waxman sent out a request for information to more than 150 electric infrastructure asset owners and operators. As of May, more than 60% had responded. Those responses led to the development of a [report on electric grid vulnerability](#). In addition to the methodology, questions, and findings, the report includes a timeline of identified threats and responses to those threats in Appendix B. It should be noted that the report identifies only 12 threats for the period from 2001 through 2008 but 14 for the year 2012 alone. While not based on a comprehensive list, this increase in threat identification is indicative of increased awareness of cyber threats to power delivery systems. This increased awareness has not been overlooked in Washington, and numerous efforts have been undertaken to address threats to power delivery systems. Many of these efforts, as described in the report's "Legislative and Regulatory Action" section, have not met their perceived potential due to a lack of consensus (few measures actually pass both the House and the Senate).

EPRI Security Interest Groups and Task Forces

Secure Remote Substation Access Interest Group

EPRI Cyber Security program has established an interest group to collaborate on securing remote substation access systems. The group provides a forum for utility representatives to discuss cyber security challenges in securing remote substation access with their peers. As an initial step, the Remote Substation Access Interest Group will leverage results from the 2012 "[Substation Security and Remote Access Implementation Strategies](#)" project.

Membership in the [Remote Substation Access Interest Group](#) is open to ALL utilities, and may include members funding EPRI's Cyber Security Program and utility subject matter experts (SMEs). To date, the group has identified gaps that can be addressed by a new collaborative research project on Secure Remote Substation Access which will be launched in the coming months as we collect priorities from those participating in the interest group. For more information, please contact Scott Sternfeld ssternfeld@epri.com.

Network Management Systems Task Force

EPRI's Cyber Security and Privacy team is addressing member needs for improved collaboration on network management systems (NMS) by initiating the NMS Task Force for members of the Security Technology for T&D Systems (P183B) project set. This task force will also serve as a source of project guidance for EPRI and as a venue for technology transfer. The Task Force will have the following objectives:

- Advance the state-of-the-art for NMS in the electric sector
- Build a community of end-users to socialize NMS concepts and practices
- Promote the development of interoperable NMS solutions
- Review and provide feedback on work products for EPRI's 2013 Protective Measures for Securing T&D Systems project

Please contact Scott Sternfeld ssternfeld@epri.com for additional information.

Incident Management Task Force

Member utilities in EPRI's Cyber Security and Privacy Program have expressed the need for increased collaboration on the topic of incident detection and management. In response to this need, EPRI has created the Incident Management Task Force to enhance existing research in EPRI's 2013 Managing Cyber Security Incidents for T&D Systems project (P183.005). Objectives include:

- Build a community of end-users to socialize incident management concepts and practices.
- Advance the state-of-the-art for incident management in the electric sector, including networks and systems that operate in the field.

Please contact John McGuire jmcguire@epri.com for more information.



INTELLIGRID – STANDARDS, COMMUNICATIONS & ENTERPRISE ARCHITECTURE (P161)

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 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)

Standards

HomePlug Green PHY Evaluation

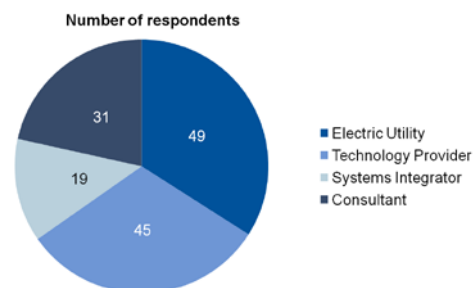
EPRI has completed an evaluation of the HomePlug Green PHY technology in a report entitled [HomePlug Green PHY Performance Evaluation: An Assessment at Sampled Field Sites](#) (3002000829) that was published in April. The HomePlug Green PHY specification was created by the HomePlug Powerline Alliance to target smart grid and smart energy applications. The focus of the Green PHY implementation was cost, coverage and performance driven by input from utilities and end-device manufacturers.

A wide range of communication technology types are represented in these concept designs and have been investigated to varying degrees, each with their own advantages and disadvantages. Wireless systems such as INSTEON, Wi-Fi, Z-Wave, and ZigBee have been evaluated in single family units where the distance between devices and to the meter is limited and the distance to neighboring residences is greater. Unfortunately the effectiveness of low power wireless technology suffers as distance and the number of obstructions increases. Unlike wireless, PLC has the advantage of being unaffected by the number of walls between the transmitter and receiver but is still affected by distance and line noise. The recent Green PHY standard was created with the intention of addressing these challenges.

HomePlug Green PHY may be best viewed as an additional tool, providing advantages over other options in certain circumstances. Green PHY holds promise as a communication technology but cannot be assumed to work in all multi-tenant, commercial building, or other challenging environments. In its present form, it appears that Green PHY would need to be tested in each environment to determine if it will operate successfully. If you have further questions, please contact Gary Aumaugher at gaumaugher@epri.com, (865) 218-8047.

The Common Information Model (CIM): Survey on CIM Adoption & Use

EPRI and Gartner are partnering to conduct a survey on utility usage of the Common Information Model (CIM) (IEC 61968 & 61970) similar to the survey in 2010 that resulted in the EPRI report [Development of the Common Information Model for Distribution and A Survey of Adoption: CIM Development and Testing Activities in 2010](#) (1020103). The goal of the 2013 survey is to ask more questions to a wider distribution of stakeholders about CIM adoption. In addition to this goal EPRI wants to determine the extent of the adoption of the Enterprise Service Bus as a tool for implementing a Service Oriented Architecture (SOA) and to uncover possible areas where EPRI's research could benefit the industry.



2010 CIM Survey Respondents

The 2013 survey revisits the applicable questions from 2010 and also gets into the impact (positive or negative) of CIM adoption by utilities. Accuracy and usefulness of the 2013 survey depends on two key factors. First, the survey respondent needs to be the most relevant person at the utility. The survey is expected to go out in August 2013. If you have any questions about the survey or would like to participate, please contact Dr. John Simmins at jsimmins@epri.com, (865) 218-8110.

IEC 61850 – Electrical Substation Automation: EPRI Consolidated Research Approach

IEC 61850 is an international standard that specifies communication networks and systems for power utility automation. Outside of North America, IEC 61850 has become a dominant standard for substation automation projects. Interest in the standard from North American utilities has grown and some utilities have started implementation efforts. These utilities, while seeing the advantages of the standard, are also experiencing challenges in implementing IEC 61850. In response to these challenges EPRI is working with these companies to overcome these challenges.

EPRI, through various programs, has done work on IEC 61850 for over 15 years. To better address the challenges that utilities face when implementing IEC 61850, EPRI is consolidating all of its IEC 61850 research into a single supplemental research project. This new supplemental project, entitled "Application Guides, Software Tools and Migration Strategies for the Implementation of the IEC 61850 Standard" is a collaborative effort between the IntelliGrid, Cyber Security, and Substations Programs. In addition, EPRI will work with its members to transition participants in the existing IEC 61850 supplemental project within the Substations Program to this new offering. For more information, contact Don Von Dollen at dvondoll@epri.com or (650) 855-2210.

Green Button

The [Green Button Initiative](#) has received a great deal of visibility over the past several months. It started as a White House call-to-action in 2011 and is now being offered to millions of electricity consumers. [Dozens of developers are offering software products](#) that make use of Green Button data to provide services to consumers.

Many utilities have provided energy usage data to their customers through their websites. The real advance that Green Button provides is offering the data in a standardized format that consists of two components: 1) a common XML format for energy usage information and 2) a data exchange protocol which allows for the automatic transfer of data from a utility to a third party when authorized by a customer. Together these define a flexible file format for Green Button. The following are some examples of Green Button data:

- Hourly load profile for past billing period plus current period to date
- Fifteen minute load profile for most recent 15 days and Daily load profile for past month or year
- Energy usage and energy demand readings
- Gas and Water usage profiles
- Yearly summary data with monthly results

EPRI is providing updates on Green Button via the IntelliGrid program and is also exploring a supplemental research project to help utilities that are considering deploying the standard. Additional information is available at <http://greenbuttondata.org/>.

Architecture and Methodologies

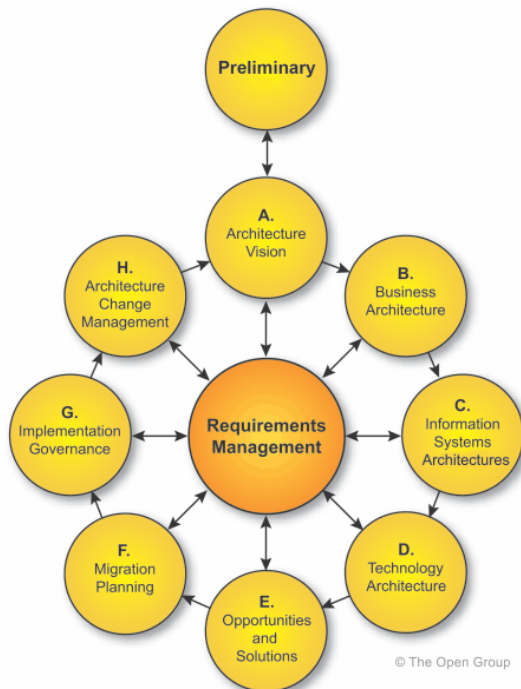
Enterprise Architecture & TOGAF

For those already familiar with the IntelliGrid Requirements Development Methodology (published as an IEC Publicly Available Specification (62559) [IntelliGrid Methodology for Developing Requirements for Energy Systems](#)) they know that it can be used to identify

actors (both human and system), and to develop use cases which can in turn be used to develop a list of system requirements. This robust methodology may also include documenting business processes and conversations with stakeholders to determine the motivations for a given utility project. These are all inputs into a roadmap as a utility moves from some "AS IS" state, to a "TO BE" state defined by the scope of the project.

For enterprise architect practitioners this may sound very familiar. Indeed it is. This is because the IntelliGrid methodology is very complementary to the Architecture Development Method (ADM), defined by The Open Group Architecture Framework (TOGAF).

TOGAF is a generic architecture development method. It is a methodology for developing architecture that facilitates the practitioner iterating through the process to refine an architecture design. The TOGAF methodology is used by the EPRI Enterprise Architecture Interest Group as it builds and refines an Enterprise Architecture repository of useful utility industry artifacts that can be used as architecture building blocks. Information about the Enterprise Architecture Interest Group and the artifacts repository can be found on the EPRI Smart Grid Resource website: <http://smartgrid.epri.com/SGEA.aspx>. The IntelliGrid methodology is especially useful for utility architects working in Phase B of the ADM (Business Architecture). Typically architects are very comfortable in Phases C and D (Data, Application, and Technology architecture development) as many architects have IT backgrounds. However, many architects are uncomfortable working in the Business Architecture domain. The IntelliGrid methodology fills this gap nicely as it is used to define all of the business pieces; the actors, processes, and use cases that need to be established to ensure that the data, application, and technology architectures adequately address the business requirements.



The Open Group Architecture Framework (TOGAF)

For more information on the IntelliGrid Enterprise Architecture Interest Group or on TOGAF, contact Dr. Gerald Gray at ggray@epri.com (865) 218-8113.



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 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.

The Field Area Network (FAN) Communications Demonstration

The First FAN Demo Meeting Prioritizes Technical Tasks and Accelerates Vendor Forums

EPRI has launched the Field Area Network (FAN) Demonstration to collaborate with utilities in various stages of FAN communications development. The FAN Demo addresses technology options; private, public, and hybrid networks; spectrum choices; the set of supported applications; and the overall system cost/benefit analysis of unified communications architecture for utility applications

The first advisory meeting with FAN Demo members was held May 29-30, 2013 hosted by United Illuminating in Orange, Connecticut. Sixteen people from the five utilities participating in the project (United Illuminating, Salt River Project, Duke Energy, Hydro One, and Great River Energy) attended the meeting. One task was prioritizing technical tasks within the project. The top five topics were:

1. Securing the FAN: Enterprise network integration, 3rd party integration for hybrid networks, edge devices, vendor vulnerabilities
2. High reliability network architecture (technology, standards, equipment)
3. Provisioning and performance of quality of service in fallback (impaired network) conditions
4. Design & performance of systems designed for AMI vs. broadband FAN technologies for DFA: metrics and analysis
5. Network Entry (public, shared, or private); Research around issues with large numbers of devices joining the network

The project's first vendor forum was held on the second day of the meeting. A representative of Firetide made a presentation on their broadband unlicensed mesh technology. Future vendor forums were also discussed and it was decided to "front load" vendor forums in the program to provide the benefit and insights as soon as possible. To accomplish this, the FAN Demo will hold additional vendor forum events over the next 12 months. One will be held in fall 2013 at EPRI's Palo Alto offices to bring in companies located in the Bay Area. Another will be co-located with (and occurring before or after) the EPRI Advisors' meeting in February 2014. The next FAN Demo Advisors meeting is in Toronto, September 4-5, 2013, hosted by Hydro One. For additional information, contact Tim Godfrey at tgodfrey@epri.com, (650) 855-8584.

Communication Standards

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.

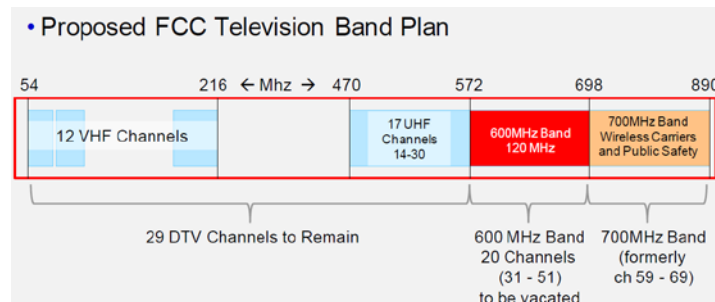
The 802.24 TAG is developing a package of IEEE 802 standards that are grid-related to raise awareness of the applicability of these standards in smart grid networks. Out of the hundreds of IEEE 802 standards and amendments, about 20 have been selected for this package. The package will include standards from 802.1, 802.3, 802.11, 802.15, 802.16, 802.20, 802.21, and 802.22. Further details on the package are available in the [802.24 document 24-12-0033-01](#).

IEEE 802.16 (WiMAX) Working Group

The IEEE 802.16 Working Group (the source of the standards known as WiMAX) has completed a pair of amendments referred to as GRIDMAN and M2M. While most cellular operators are implementing 3GPP LTE as their 4G network, WiMAX continues to offer an alternative 4G network option to utilities implementing Field Area Networks, with potential cost and complexity advantages. In summary, higher reliability is achieved by supporting dynamic network reconfiguration in the event of failure or damage to one part of the network.

The 802.16n and 802.16.1a GRIDMAN amendments were approved in March 2013, and published in June 2013. In a sense, the publishing date of a standard is symbolic. In most cases the interested parties (vendors) are aware of the contents of the standard. For mass-market standards like 802.11, products are often available before the standard is published (remember "draft 802.11n" products?). The WiMAX Forum Smart Grid Working Group will drive interest and awareness of the GRIDMAN and M2M capabilities through future revisions of the WiGRID profiles.

TV White Space Technology and Standards



TV White Space is a term given to unused channels in the VHF and UHF television broadcast bands. As a lightly-licensed spectrum resource in a band with very desirable propagation properties, TV White Space is relevant to utility communications.

The FCC is preparing to auction off more of the television spectrum, as described in the [Notice of Proposed Rule Making \(NPRM\)](#) released in the fall of 2012. TV broadcasters will be incentivized (paid) to relinquish their licenses in channels 31 to 51 through a reverse auction. Once the spectrum is vacated, the FCC will conduct a

regular auction to sell spectrum in the 572 – 698 MHz band to the highest bidder. This action will reduce the number of TV channels to 29, and undoubtedly reduce the availability of TV White Space spectrum for unlicensed users. However, TV White Space systems will remain a viable option in rural areas, unless broadcast television is eventually eliminated entirely.

Trials and deployments of TV White Space systems are progressing around the world. Microsoft is developing a TV White Space broadband system in [Tanzania](#). [Trials in the UK](#) are being extended to [Cornwall](#) and are moving toward broader rollouts in 2014.

TV White Space – EPRI Research

EPRI is conducting testing on a commercially available TV White Space system under a Technical Innovation (TI) program. Testing will be conducted in two cities with different sets of available TVWS channels. Testing will include basic parameters such as range and throughput, and also explore behavior over a variety of paths and distances, using a “nomadic” remote station and a fixed base station. Long term link reliability will also be tested by measuring metrics over periods of days or weeks. The equipment has been received, after extensive delays. Initial “bench top” testing and configuration is being conducted now, and field testing began in June 2013.



DATA ANALYTICS AND THE DISTRIBUTION AND TRANSMISSION “BIG DATA” DEMONSTRATIONS

EPRI’s multiyear international demonstrations on “Big Data” identify and analyze data-oriented applications and support infrastructure through collaborative demonstrations around the world. The following 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).

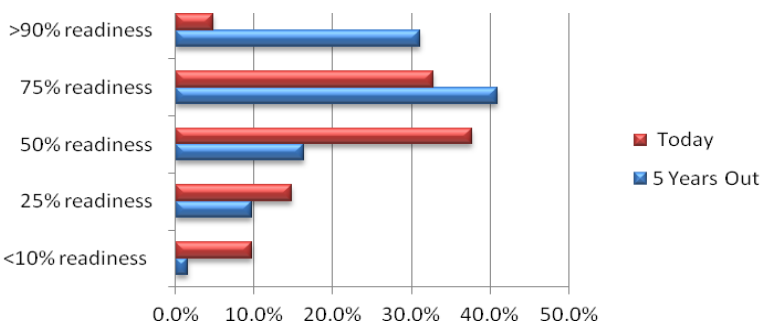
EPRI “Big Data” Survey Results

EPRI’s 2013 “Big Data” survey was designed to collect information about the state of the electric utility industry in terms of big data, data analytics, and supporting infrastructure related preparedness, challenges, and opportunities as a deliverable for the DMD & TMD Projects.

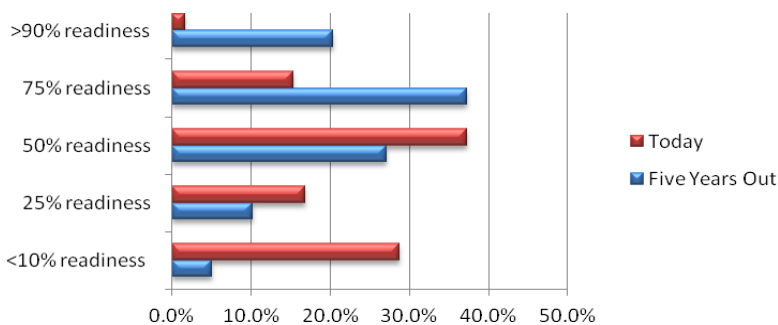
Ready or Not?

One of the key topics from the big data survey focused on preparedness in terms of both data and associated acquisition technology. Specifically, the preparedness questions focused on the ability to collect, manage, and take advantage of the opportunities afforded by new data sets. As it turns out, almost half of the survey respondents believed that Big Data and associated analytics were not on their radar screens or even in their plans five years ago. The state of the industry today with respect to the survey respondents is that Big Data is on their company’s radar with a key takeaway that a research initiative focusing on data analytics is not just timely but is also an important segue for electric service providers to collectively define best practices around data governance, data analytics, and data value quantification.

Complementing this finding, best practices around data were one of the key requirements used in the EPRI Smart Grid maturity assessments from the past decade. However, for a number of reasons—such as financial constraints, technology dynamics, workforce readiness, and increased cyber security focus—many utilities have taken a slower-than-projected approach to changing their business models with respect to data and associated analytics. This is not necessarily a bad thing, because the utility industry will benefit from following in the footsteps of some of the other industries at the forefront of the Big Data inundation. However, it is important to recognize that data is an asset, and until this asset is managed and prioritized properly, the utility industry will lag in realizing the full benefits of a communications-enabled Smart Grid.



Comm's & IT Infrastructure Preparedness Supporting Data Analytics Today vs. 5 yrs Out



Data Management Preparedness Today vs. 5 yrs

Data Analytics and Social Media

Big Data Insight - Reframing the Box Surrounding the Use of Social Media

The running total for data-oriented applications identified under the EPRI Big Data Analytics initiative has gone over the 100 mark in terms of unique topics. One of the more simple and effective applications that we have heard of for customer communication, places a new spin on the use of social media.

The application is a simple use of social media to give customers impacted by outages a little more information about their outage in addition to an estimated restoration time. The concept is that for certain outages, such as an automobile hitting a pole or a tree down across the lines, the responding line crew would take a few photos of the offending tree or accident, and these impactful visuals can then be placed on the information and social media website to supplement the estimated time to restore. Psychologically, it is believed that giving the customer just a bit more information on the outage and some visuals during the restoration is paramount to customer patience, tolerance, and even compassion for what the repair crew is dealing with. The end result in some cases can be customers who view the line crews and the utility as an ally and partner in getting things back to normal.

When retelling the approach to a few other project sponsors, the initial reaction that EPRI received was “that’s a great idea” and “I intend to borrow that one as soon as I get back to the office and can make something happen in that space.”

As utilities are recognizing the value of social media and how it helps them improve their engagement with customers, a range of new opportunities as well as some challenges exist. EPRI is facilitating three regional workshops to discuss emerging opportunities and challenges with the use of social media in support of outage management. Two workshops have already occurred, one in New York hosted by Consolidated Edison and another in Dallas hosted by TXU Energy. The final workshop will be held on [August 12-13 in San Francisco hosted by PG&E](#).

With the renewed focus on grid resiliency, the question arises: Does social media have a place in the utility’s overall restoration efforts? A summary report of the key findings from all three sessions will be released this fall. A preview of the results presented at an optional afternoon session during the PDU Sector Council Meeting in Baltimore on Thursday September 12th. For more information, contact Dr. John Simmins at jsimmins@epri.com, (865) 218-8110.



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 the most recent [Smart Grid Demonstration Update](#), a newsletter available at www.smartgrid.epri.com. For more information, contact Gale Horst at ghorst@epri.com.

Smart Grid Demonstrations – New Case Studies and Technology Transfer Forums

[5-Year Update Highlights Nine New Case Studies and References to over 200 Related Deliverables](#)

Since its inception over five years ago, utilities participating in the Initiative have completed multiple field projects that are at the vanguard of smart grid development, and are helping to define state-of-the-art practices for building a smarter grid. This international collaboration allows us to tap into world-class expertise and experience and share results that can benefit a wide variety of smart grid projects in conducting tasks ranging from project planning, implementation, to cost benefit analysis. In this five-year update, case study briefs summarize specific results of research projects highlighting projects conducted by 8 of 23 participating utilities. Examples of case study results include insights into how seasonal loads can affect conservation voltage reduction; how to obtain real-time information on when capacitor banks are failing; and how an autoground approach can be used for anti-islanding protection of distributed generation

[In this 5-Year update \(available in the first week of August\)](#) we also identify technical reports and other publications that have been delivered as part of the Initiative at the five-year mark. The 200+ deliverables that have been produced contributed to the second edition (December 2012) of the [Smart Grid Reference Guide to Integration of Distributed Energy Resources \(EPRI product 1025763\)](#). This is an extensive reference to smart grid project activities and results; it is the primary deliverable of the Initiative and is updated annually.

On-Site Smart Grid Demonstration Technology Transfer Forums

As the seven-year Smart Grid Demonstration Initiative (SGDI) is coming up on its final year of efforts in 2014, a wealth of knowledge, lessons learned, resources and references have been developed. To foster deeper learning for utility members and staff that may not have been directly involved in the project, EPRI is facilitating half-day workshops on-site for the 23 members from now through 2014. A “pick-list” of 20 topical presentations can be customized for each member presentation.

- | | |
|--------------------------------------------------------------------------------------------------|---------------------------------------------------------------------|
| 1. Volt/Var Optimization (VVO) and Conservation Voltage Reduction (CVR) | 10. Demand Management / Demand Response |
| 2. Grid Management (DMS, DM, Data Mgmt, DA, Asset Health Monitoring, PQ) | 11. Peak Load Shifting |
| 3. Modeling and Simulation | 12. Smart Grid Standards development / OpenADR / CEA2045 / SEP etc. |
| 4. Building Energy Management | 13. Use Cases - purpose, development, and examples |
| 5. Managing Concurrent Operation of Multiple Technologies (cross-technology & cross-utilization) | 14. PV and Integration & Support of Renewable Energy Variability |
| 6. Cyber Security in the Smart Grid Space | 15. The Virtual Power Plant (VPP) concept |
| 7. Residential Consumer Technologies (SEP), Pricing Programs, and Customer Engagement | 16. Integrating DER into Utility Architecture and Systems |
| 8. Overview of EPRI Smart Grid Training (Review content of SG training DVD set) | 17. Communications (Field Area Network) |
| 9. Energy Storage - in the Smart Grid Demo | 18. Hypothesis - definition, development, and usage |
| | 19. Cost Benefit Analysis (CBA) |
| | 20. Electric Vehicles in the Smart Grid Demo (EV, PEV, PHEV) |

For more information or to schedule an on-site session, contact Gale Horst at ghorst@epri.com, 865-218-8078.

**August 6-7, 2013, National Electric Sector Cybersecurity Organization & Resource (NESCOR) Workshop, Arlington, VA**

EPRI is facilitating this [NESCOR](#) workshop to:

1. Bring the relevant industry stakeholders to meet face to face and discuss the critical issues for electric sector cyber security
2. Review the last 3 years work in each technical working group
3. Share current NESCOR results with industry, academia, and regulatory organizations and determine next steps

Industry, academia, and regulatory organizations are encouraged to attend. To register for this workshop, [click here](#).

August 12-13, 2013, EPRI Social Media & Outage Management Western Regional Workshop, San Francisco, CA

EPRI is conducting a series of workshops to examine the opportunities for using customer-generated data via social media and other means to improve outage management capabilities and situational awareness in general. This workshop, hosted by PG&E in San Francisco is the third and final workshop and is open to electric utility personnel. For more information, [click here](#).

August 22-23, 2013, EPRI Transmission Physical Security Summit, Charlotte, NC

EPRI and NATF are inviting you to participate in the Transmission Physical Security Summit to be held August 22-23 at the EPRI facilities in Charlotte NC. Outages from intentional attacks on the physical security of utility assets are rare but serious. Recent events in the industry have heightened awareness of the vulnerability to physical damage to the power grid infrastructure (transmission and substations). To register for this summit, [click here](#).

September 6, 2013, Grid Open Source Software Alliance (GOSSA) Kick-off Workshop, Arlington, VA

This free ½ day workshop examines the proposed collaboration of industry and government and key elements of the [GOSSA initiative](#). EPRI, along with industry and regulatory representatives will explore how Open Source Software (OSS) may be utilized in the electric power industry and discuss multiple facets and perspectives. To register for this workshop, [click here](#).

September 9-11, 2013, EPRI Power Delivery & Utilization (PDU) Advisors Meeting, Baltimore, MD

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 strongly encouraged to participate in these twice-a-year meetings as a benefit of your EPRI membership. [Click here to register](#) or for more information, contact Ashley Eldredge at aeldredge@epri.com, 650-855-2063.

September 11-12, 2013, EPRI Power Delivery & Utilization (PDU) Sector Council Meeting, Baltimore, MD

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 first meeting of the new ICT Sector Council currently made up of 23 CIO's and Security/IT leaders. [Click here](#) for more info.

September 23-25, 2013, Utility Analytics Week, Atlanta, GA

EPRI is participating as part of Distribution and Transmission Modernization Demonstrations (DMD & TMD) on Data Analytics and as a key deliverable for this project, EPRI is hosting a strategy roadmapping session on September 23rd and an application value case session on September 25th. <http://utilityanalyticsweek.com/>

October 1-3, 2013, EPRI Transmission & Substations European Task Force, Warwick, United Kingdom

The EPRI Power Delivery and Utilization Sector will hold an European Task Force Week in order to engage fully EPRI's Task Force Advisors in Europe and beyond. The objective of this meeting is to provide a status update of the 2013 tasks and to obtain input for the 2014 plans. The meeting also provides attendees a great opportunity to interact with EPRI experts and their peers from across the region. A focused ICT session on October 3rd will focus on Cyber Security and Data Analytics. For more information or to register, [click here](#).

October 23rd, EPRI Data Analytics Workshop, Boston, MA

EPRI is hosting a Data Analytics Workshop October 23rd immediately following the second [Grid of the Future symposium](#) is sponsored by the CIGRE US National Committee (USNC) October 20-22, 2013. This workshop is open to utility personnel only and there is no registration fee for this one-day workshop, but seating is limited, so early registration is encouraged. Agenda and registration information can be found at: <http://www.cvent.com/events/epri-data-analytics-workshop/event-summary-06605a5aec1d415ab5f353ed7414cd0b.aspx>

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>

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