



Newton-Evans Research Company's

Market Trends Digest

July 2012



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Third Quarter Activities

Major international research study on behalf of CIGRE Work Group

Newton-Evans Research is actively supporting the CIGRE Joint Working Group (JWG) B5 D2.46 with the conduct of an international study of protection and control cyber security activities. The findings from this study will be used as reference material for the development of the JWG's Technical Brochure. The findings will be presented at the upcoming CIGRE conference, being held in Paris, France during the week of August 26, 2012 (see www.cigre.org for more information). While the study will run through mid-August, we have already obtained study participation from qualified industry officials in more than 25 countries.


The information collected thus far indicates an urgent requirement for strengthening methods, procedures and practices related to protection and control technology usage related to device (installation, testing and maintenance) both centrally and remotely. The need for improving cybersecurity training programs for utility staff and for contract personnel is apparent from the preliminary findings. An in-depth study, the survey includes nearly 40 topical questions on current and planned practices.

Conduct of major nationwide research study on behalf of leading American engineering university

Another concurrent study underway is focused on standard operating procedures and visualization trends in large power control centers operated by ISO/RTO organizations and transmission utilities in North America. The study also includes detailed inputs from the EMS developer community regarding their views on practices and plans to improve the effectiveness of control center operations.

Newton-Evans Research findings among major contributions to new smart grid textbook: *Smart Grids: Infrastructure, Technology, and Solutions*.

Chuck Newton has been a principal contributor to three chapters of a soon-to-be-published textbook on smart grid. The chapters in which our work is referenced includes *Chapter 1: Overview of the Electric utility industry*; *Chapter 2: What is Smart Grid, Why Now*; and *Chapter 6: Smart Grid: Where Do We Go From Here?*

A utility pole stands vertically on the right side of the frame. It is equipped with a transformer box, several power lines, and a series of white insulators. The background is a clear blue sky, and the foreground is a field of bright yellow flowers. The text is positioned on the left side of the image.

Edited by Siemens' Stuart Borlase, *Smart Grids: Infrastructure, Technology and Solutions* will be among the foremost guides to understanding smart grid developments around the world. More than 20 individual contributors have provided insights, observations, facts and opinions about the electric power grid of today and the evolving smart grid of tomorrow. The book has been in development for more than two years and will be a timely and insightful guide for industry observers.



Industry Survey Confirms Efficiency Advantages of Intelligent Substation Design

The following has been excerpted from a white paper developed for Bentley Systems in June of 2012.

Research conducted by Newton-Evans Research Company between April 12th and May 30th 2012 produced findings from eighty-six respondents which included seventy-seven utilities (fifty-five North American utilities and twenty-two international utilities). Responses from nine consulting engineers/EPCs provided an insight into their substation software design needs.

Respondents to the utility survey included management decision makers (directors and managers), supervisors, lead engineers, engineers, etc. About half of all responses to the survey included feedback from managers or directors.

Utility officials were asked whether they perform their own substation design work in-house using a generic CAD application, a substation-specific design application, or whether they outsource this work to a third party. An overwhelming majority (73%) of the utilities that perform all or some of this work in-house indicated they use a generic CAD application. This includes utilities that use both types of software (5%) and utilities that use generic CAD and also outsource (10%).

Among the seventy-seven participating utilities, only two utilities in Europe currently use a substation specific design application exclusively. Three other utilities use both generic CAD and substation-specific applications. Eight of the nine consulting engineers (88%) only use a generic CAD application. The other one uses both types.

Five of twenty-four utility directors/managers (21%) currently using a generic CAD application indicated an interest in purchasing a substation-specific design application in the future.

The majority (90%) of utilities and consultants indicated their current design tool does not generate reports for cost estimating, equipment ordering, and

Generic CAD Application:

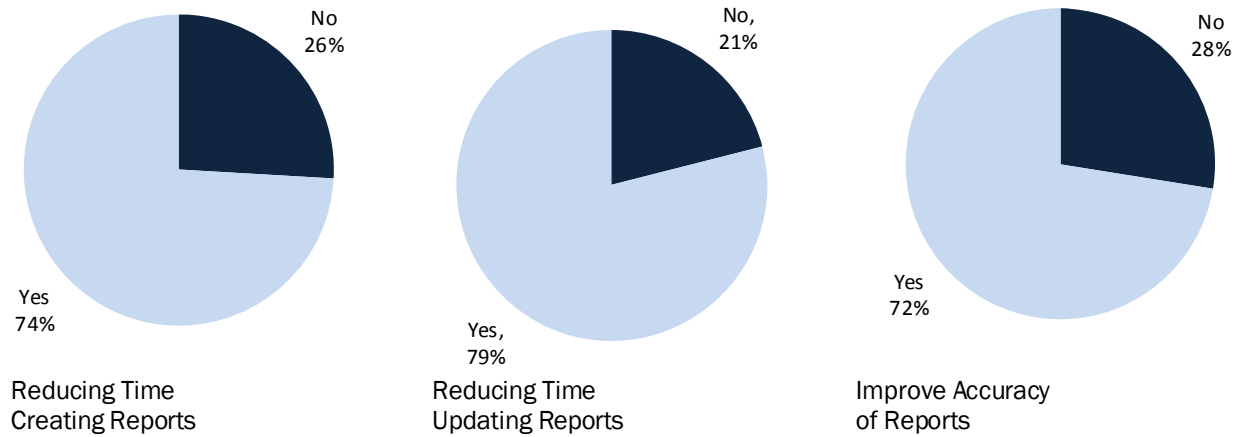
a non industry-specific drafting tool that lacks specific design aids or productivity tools for electric substation engineering.

Substation-Specific Design Application:

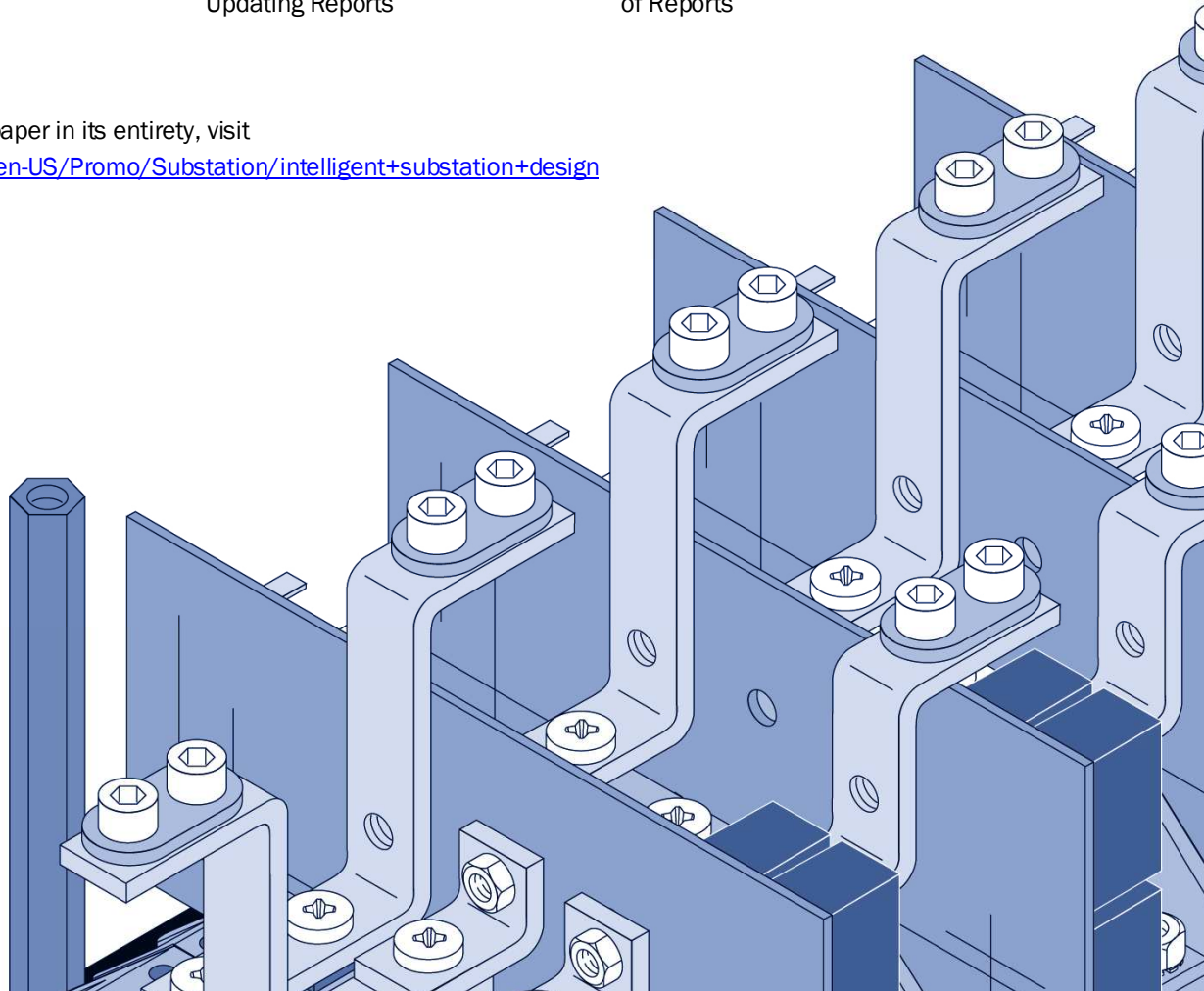
a software application expressly developed to facilitate the physical and electrical design of electric substations through the employment of some or all of the elements of intelligent substation design.

asset management. However, when asked if they had access to a tool with this capability, about 75% of respondents indicated that it would produce significant project cost savings by reducing the time spent creating reports, reducing the time to update reports when design changes occur (Figure 5), and improving report accuracy.

Would integrating your substation design software with supporting business processes and applications contribute to the following:



To read the white paper in its entirety, visit www.bentley.com/en-US/Promo/Substation/intelligent+substation+design



Global Survey Ranks Protective Relay Manufacturers in Several Categories

During the months of May and June of 2012, Newton-Evans Research conducted a survey of electric utilities inquiring into how they rank global relay manufacturers in different areas.

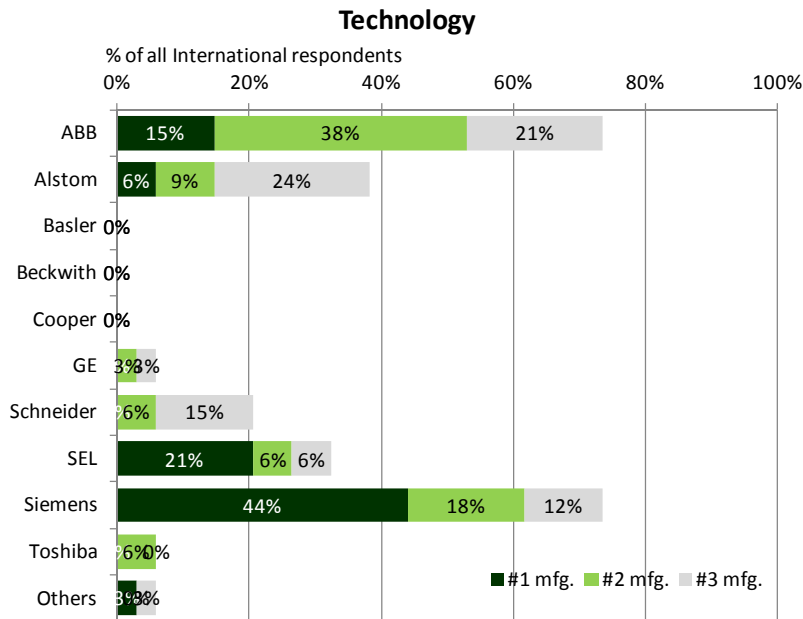
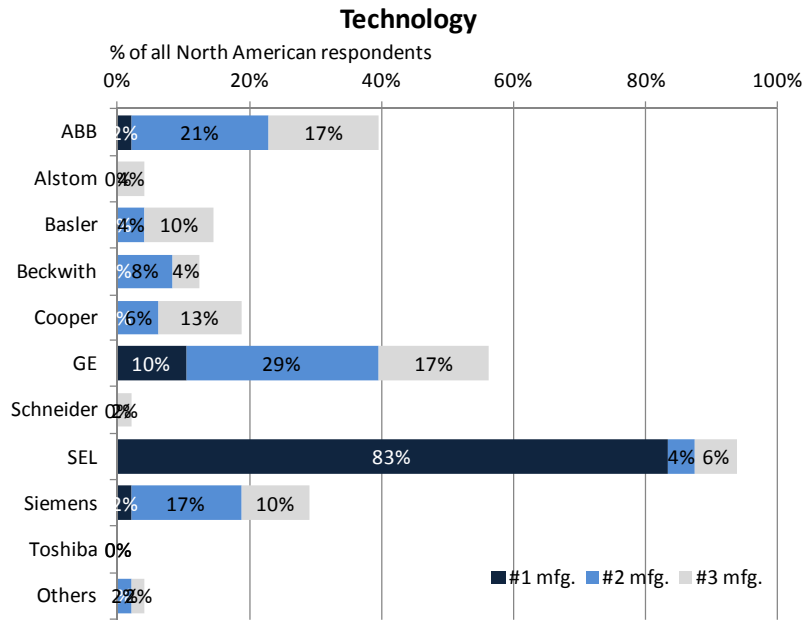
Findings reported in this study reflect the input of officials in operations and planning at 82 electric utilities worldwide. Respondents were given an example list of relay manufacturers and asked to list their #1, #2 and #3 preference in each attribute category: Technology, Price, Flexibility to add new features, Technical service/support, Security against hackers, Ease of use/setup, IED spares & maintenance, Web/Internet info. Respondents were also asked to rank each attribute on a scale of 1-8, where 1= “most important factor when buying.”

North America	<--most important					least important-->			<i>total</i>
	<u>1</u>	<u>2</u>	<u>3</u>	<u>4</u>	<u>5</u>	<u>6</u>	<u>7</u>	<u>8</u>	
Technology	21	9	6	5	2	2	2	0	47
Price	0	5	12	9	9	6	3	3	47
Flexibility to add new features	1	3	7	4	9	9	9	5	47
Technical service/support	17	16	6	7	1	0	0	0	47
Security against hackers	0	2	3	4	6	17	6	9	47
Ease of use relay set-up	7	10	7	8	9	2	3	1	47
IED spares and maintenance	1	2	5	8	5	6	17	3	47
Web/internet information	0	0	1	2	6	4	7	27	47

International	<--most important					least important-->			<i>total</i>
	<u>1</u>	<u>2</u>	<u>3</u>	<u>4</u>	<u>5</u>	<u>6</u>	<u>7</u>	<u>8</u>	
Technology	22	2	1	2	2	2	0	3	34
Price	3	12	6	5	2	2	4	0	34
Flexibility to add new features	0	8	5	1	2	10	6	2	34
Technical service/support	5	9	9	3	6	2	0	0	34
Security against hackers	1	1	4	3	4	4	8	8	33
Ease of use relay set-up	1	0	7	9	12	2	2	1	34
IED spares and maintenance	0	2	2	10	4	9	6	1	34
Web/internet information	1	0	0	1	2	3	8	19	34

Note: 1 utility declined to answer because they only have experience with one Manufacturer.

Utilities were asked to write in their #1, #2 and #3 choice of relay manufacturer for each attribute. Here are the results of the widely chosen “most important” category, “Technology.” Note the importance of regional cross tabulation groupings and the differences in supplier rankings.





Medium Voltage T&D Equipment Market Overview Series

The Newton-Evans Research Company has announced the publication of a series of 18 electric power distribution market two-page snapshot market summaries. The new series of market overview reports (executive market summaries) includes supplier listings, representative products, and estimated market size for each topic, vendor market share estimates and market outlook through 2014. Electric utilities accounted for nearly two-thirds of purchases of the medium voltage product categories in this series. A majority of the included equipment and products were produced in the United States.

The Medium Voltage equipment series is priced at \$1,500 for all 18 market summary reports, or at \$150.00 for individual report summaries. Each snapshot report include estimates of U.S. market size, supplier market share and outlook through 2014 for these categories: Air Insulated Metal Clad Switchgear, MV Motor Controllers, MV Gas Insulated Switchgear, Automatic Circuit Reclosers, Outdoor Distribution Circuit Breakers (5-38kv), Load Interrupter Switchgear, Overhead Disconnect Switches (15-38kv), Sectionalizers; MV09 – Fused Cutouts, Pad Mounted Switchgear, Submersible Switchgear, Bus Duct and Bus Bar, Substation Class Pad Mounted Capacitors, Current/Instrument Transformers, Fault Current Limiters, Fault Current Indicators and Faulted Circuit Indicators, Current Limiting Fuses and Fuse Links, and Surge Arresters.

Other U.S. T&D market snapshot series currently available include power transformers (11 market segment snapshots), protective relays (8 market segment snapshots) and substation automation components (13 market segment snapshots). The next series to be released covers Distribution Automation in 12 market summaries, and is planned for publication later in July, 2012.

Further information on each series of U.S. T&D market snapshots is available from Newton-Evans Research Company, 10176 Baltimore National Pike, Suite 204, Ellicott City, Maryland 21042. Phone: 410-465-7316 or visit www.newton-evans.com for a brochure or to place an order. For subscriptions to all of the currently available report series, please call or email us for special introductory pricing offers.



Looking at Smart Grid Opportunities for Growth at Mid-Year 2012: What stands in the Way?

Why we believe the near-term investment priority for utilities of all types must be cyber security-related (Security is not always considered part of smart grid spending)

First and foremost what stands in the way of more significant growth in smart grid-related investment is the state of the global economy.

It isn't totally doom and gloom, but then.... currently, all eyes are on Western Europe, and on the harbingers for economic growth or lack thereof, in North America, the slowdown in China and other parts of Asia. In mid-2011, we took a relatively cautious view of the outlook for smart grid investments, as many utilities simply could not afford to make significant investments then or now.

Our mid-2011 research series entitled *The Worldwide Smart Grid Market in 2011: A Reality Check and Five Year Outlook Through 2015* was well received by key, clear-headed market participants and other observers of the smart grid marketplace, even though we had suggested that real growth in smart grid would be spaced out over many years, and overall smart grid market investments would grow only in the mid-upper single digits (on average) each year.

Let's take a look at what is happening around the world that causes Newton-Evans to continue to retain a cautiously optimistic view of most smart grid market segments. We reported quite accurately on these likely developments in that mid-2011 study:

- Slowdown in China
- Critical financial and economic issues facing the Eurozone
- Minimal growth in Western Europe outside of the Eurozone
- Retrenchment in economic outlook for the United States (as it remains the single largest country market in the world).
- World Bank and NGO outlook that suggested continuation of low growth.

A few weeks back, there were some trade press headlines suggesting (incorrectly) that the smart grid was approaching umpteen billion dollars. To put much faith in that fairy tale of a report summary would be dangerous and misleading, as others have also stated. The true global market for all segments of smart grid activity (not counting infrastructure) relating to transmission, distribution, and consumer premises activities (AMI, DR, and the like), currently amounts to about 5% of that rose-colored glass outlook, or about \$10 billion USD in our considered view. This amount includes all spending for control center systems, automation programs for substations and distribution networks, smart devices to monitor transmission activities, demand response and advanced metering infrastructure. This amount also includes all relevant operational software required to manage the data acquisition and analysis of real-time and historical data.

Certainly, unless the nation and the world lose the little positive economic momentum we now enjoy, there will very likely be a continuation of the mid-to-upper single digit growth rate overall for smart grid activities during the remainder of 2012 and through 2013. Some activities will grow faster (like DA), while others remain sluggish. Much hinges on the various steps being considered or enacted by regulatory and legislative bodies in countries around the world. A high percentage of these deliberations will consider the overall economic effects that such decisions will have on utilities and consumers of all types. Some major utilities will continue to forge ahead, as the daily webinars indicate they are doing. However, it is a rather small group of utilities that currently accounts for a very high proportion of smart grid spending, not just in North America, but globally. The majority of others are still either taking a “wait and see” attitude or hoping that their coffers will soon show more profitability that will enable those companies to make significant investments in one or multiple smart grid segments.

I am a believer that a lot of “wannabe” smart grid investments are being diverted, or will very soon have to be diverted, to better protecting utility IT and operational cyber assets, and this simply will take precedence over the requirements to upgrade equipment, smarten up field monitoring and control devices, revamp communications network architecture and re-energize the electric power grid itself.

This year, Newton-Evans Research has already undertaken a number of national and international studies of cybersecurity issues, and the findings lead us to believe that the single most critical issue facing utilities of all types is the near-term requirement to shore up cyber defenses, policies and

procedures. Unfortunately, these cyber security investments will likely continue to usurp funding from other smart grid activities, but this investment must be a priority, in my opinion.

Keep in mind the first priority of every electric power utility – “keeping the lights on” means protecting the system at all costs. Thus, improving system protection and control procedures together with strengthening cyber defenses may well be the key aspects of smart grid development in the near term. We are “robbing Peter to pay Paul” in some real sense, but this is probably a very judicious way to invest for the remainder of 2012, based on what the “surveys say” at this time.

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P.S. Looking for an opportunity to share in our findings? Join your colleagues in the power industry who have benefited from a full year of having accurate descriptions of the smart grid market and its constituent sub-markets. If you haven't already subscribed to *The Worldwide Smart Grid Market in 2011: A Reality Check and Five Year Outlook Through 2015* this would be a great time to do so. (See the reports page to order (www.newton-evans.com/reports)). Keep in mind that we will send the mid-2012 update with our compliments – at no extra charge – as soon as it is available.



ABB and Tropos Networks: Adding Another Company to ABB's Basket of Smart Grid "Goodies" alongside the Thomas & Betts and Ventyx Acquisitions

by Chuck Newton, June 4, 2012

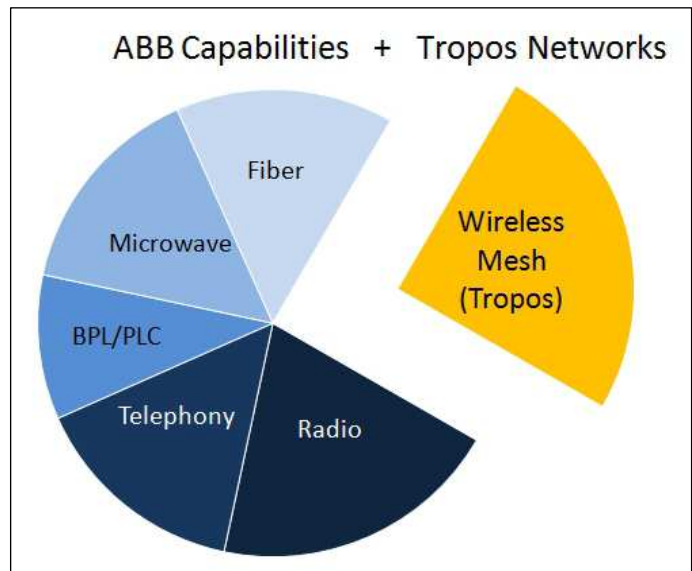
The brief ABB announcement of June 1, coupled with Tropos Networks CEO's note to friends of the company on June 4, highlight this new acquisition achievement on the part of ABB's strategic planning groups based in Switzerland (and Germany, and Sweden, and the U.S.A.). Some readers may not be aware that ABB is a key global player in the utility telecommunications field, winning contracts annually worth hundreds of millions of dollars with its own extensive communications equipment offerings, and supplemented by one of the world's largest telecommunications network design and development service organizations.

Internationally, many countries outsource the design, development and upgrading of telecommunications networks across the energy spectrum. This is especially true for the developing regions of the world. Key participants in this billion dollar-plus marketplace include the global control systems companies such as Siemens and Alstom Grid, along with ABB. Other key participants in energy telecoms network development include Alcatel, DIMA, RFL, Selta and Telvent.

Let's take a closer look at this key ABB acquisition. First, keep in mind that one of the few "gaps" remaining in ABB's rather pervasive communications offerings is wireless mesh technology. This gap is found in the wireless mesh portion of Tier Two network requirements, and may well extend to "Tier Three" level of utility/energy telecommunications – the field area networks required for distribution automation (not to the NAN or to the meter). ABB has a long and successful history of providing telecommunications systems for Tier One (backbone network infrastructure) and much of Tier Two (backhaul) networks for utilities and energy companies around the world, mainly outside of North America. This opens many doors to ABB clients who have worked with the company in the development of the first two tiers, and who are preparing for additions to Tier Two and work on Tier Three network development.

ABB is a highly regarded telecommunications equipment manufacturer (or OEM buyer) in just about every other communications technology area that impacts energy and manufacturing industries, including multiplexing, teleprotection, local area network switches, power line carrier equipment, microwave systems and voice communications. Its wide ranging “Fox-family” product offerings have played a key role in its success in energy telecommunications. ABB engineering skill sets and capabilities can be found in radio, microwave, telephony, fiber (SONET and SDH), BPL and PLC technologies.

Tropos Networks, a 12 year-old privately-held Silicon Valley firm, has grown from start-up status to leader, and an international market participant, in the growing market for wireless mesh technology to support smart grid initiatives, (especially for advanced metering infrastructure, and to some extent for distribution automation) and has a leading position in the provision of municipal/metro area broadband services. The company has shipped some 60,000 routers to more than 850 customers in 50+ countries to date.



However, reading between the lines of this important acquisition, in addition to gaining wireless mesh products, the synergistic benefits accruing to ABB also include the small but strong engineering and support services staff of Tropos Networks, which now will be able to tackle assignments yet to be won by ABB that are further afield from its North American roots. This service capability supplements the company's highly touted line of wireless mesh equipment. Tropos Networks products and services will also gain a market position in the gas/oil pipeline business and in certain industrial and mining applications where wireless mesh technology can be used as an adjunct with other specialized ABB-developed communications approaches. Freshen up those passports, Tropos staff!

GridWeek 2012: Oct. 2-4 2012

Globally recognized as the must-attend gathering dedicated to the modernization of our global Smart Grid, GridWeek is the only event that attracts the complete diversity of global electric-industry stakeholders to explore Smart Grid's impact on the economy, utility infrastructure, consumers and the environment. Now in its sixth year, GridWeek is planned by a representative committee of 14 industry stakeholder groups to ensure the agenda is focused on the most pressing industry topics.

Utility leaders, policymakers, regulators, researchers, technologists, advocates – there's no better place to meet the industry's movers and shakers, forge new relationships, and uncover new business opportunities.

As grid-modernization and smart grid efforts provide the energy industry with more information, a broader system view, and more efficiency and control, we are faced with increasing complexity. The challenge lies in deriving value from that complexity – for all stakeholders. GridWeek 2012 will tackle the challenge of deriving value from this complexity – gathering utility, policy, regulatory and consumer experts to approach the topic head-on.

Providing a mix of in-depth panel discussions, value-focused case studies, and a forward look at how the ever-changing energy landscape will impact the electrical grid, GridWeek will explore three key themes:

Stakeholder value: A look at the value of grid-modernization efforts for diverse stakeholders, including utilities, consumers, government and more.

Managing complexity: Discussions on managing complexity of the ever-changing energy landscape – from the integration of microgrids to the growing importance of natural gas – as well as the challenges in handling increased volumes of data through analytics, building secure networks, managing expectations on privacy and more.

Smart energy policy: In an election year, it's hard to ignore the impact of politics on the energy industry. GridWeek will gather top political minds to discuss how election results could alter the path we're on – or even provide a clearer road map.

For more information on this conference visit www.gridweek.com/2012

GridWeek Delivers:

The industry's top speakers tackling the most relevant Smart Grid subjects.

Unprecedented networking opportunities with complete diversity of global stakeholders.

