



Newton-Evans Research Company's

Market Trends Digest

October 2013



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Newton-Evans Fourth Quarter 2013 Research Efforts and Topics

In-house Studies

Substation Automation & Integration: 2014-2016

This survey-based report series is currently in the planning stages. Newton-Evans is currently requesting suggested topics for inclusion in the survey questionnaire from early subscribers to this series.

RESEARCH IS CURRENTLY PLANNED TO BEGIN SHORTLY. THIS IS THE FINAL OPPORTUNITY FOR SUBMITTING CLIENT INPUT TO THE SURVEY BEFORE IT GOES OUT. VISIT OUR REPORTS PAGE NOW AND ORDER WITH A CREDIT CARD TO SAVE \$1,500 OFF THIS 4-VOLUME REPORT SERIES DUE OUT IN JANUARY 2014!

<http://www.newton-evans.com/our-reports/#SSA2014>

For examples of previous Substation Automation studies, see our reports page or go to the following URL for samples from the past study:

www.newton-evans.com/SSA2011_Samples.zip

Recent Reports

American Manufacturing and Systems Integration Capabilities for Power Grid Modernization – Important Resource for staff and management at manufacturing companies and systems integration firms. Multiple facets of “smart grid” are discussed, including substation modernization.

Assessment and Overview of the World Market for Time Synchronization in Electric Power Substations: A Utility and Industry Survey-Based Report on Precision Timing Requirements - “Must Have” Information on Timing Requirements for Substation Modernization Programs involving utility clients at the substation level.

Global CAPEX and O&M Expenditure Outlook for Electric Power T&D Investments: 2013-2014, Funding Outlook for Smart Grid Development Based on Summer 2013 Survey Results - Great resource for global and regional outlook on grid modernization- focused on control systems, substation modernization and other key components of “smart grid” interest to the supply and demand side of electric power delivery industry.



World Market for Substation Automation & Integration 2014-2016

Research is currently planned to begin shortly. This is the final opportunity for submitting client input to the survey before it goes out.

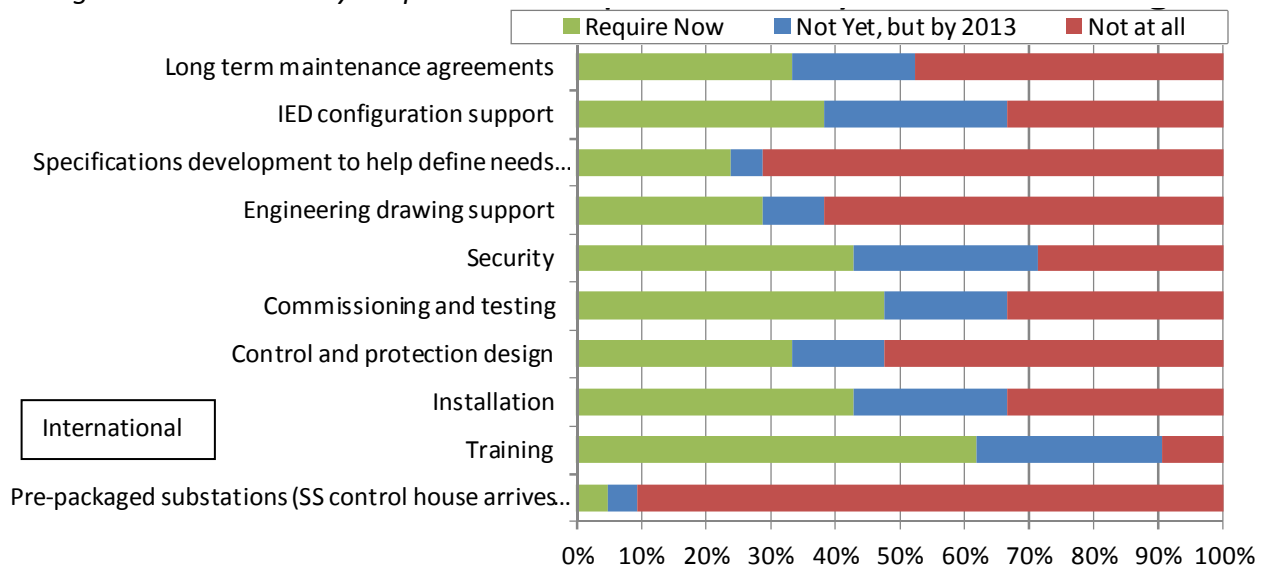
Here are some excerpts from the last report series on this topic, published in 2011:

External assistance that will be needed by utilities for substation automation and integration-related activities

In North America, engineering drawing support was indicated as a near-term requirement by 38% of the respondents. Training services followed with about one third citing a need for educational support. Growth areas for services are expected for security-related services (vulnerability assessments, remediation services), training services and installation support.

Internationally, personnel training was the substation-related activity that most required outsourcing to a third party. Sixty-two percent of international respondents required assistance with training in 2011, and 29% were expected to require it by 2013. Commissioning and testing, Installation, and security also required third party assistance in 2011 by more than 40% of respondents, similar to the 2005 survey results.

2010 External Assistance Required for Substation Automation-related Activities Among International Utility Respondents

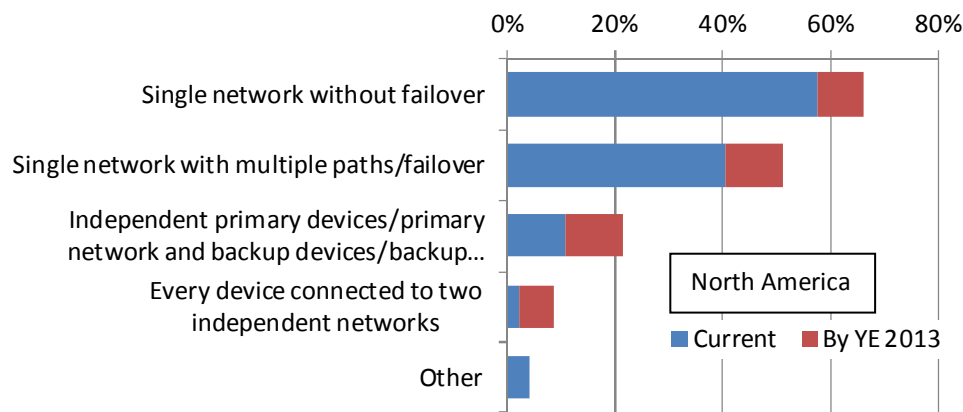


Substation Ethernet LAN architectures planned for use by year end 2013

In North America, respondents by and large (57%) indicated they were using “single network without failover” architecture for substation Ethernet LANs at year end 2010. Forty percent indicated some use of “single network with multiple paths/failover”. About one in nine respondents was using “independent primary devices/primary network and backup devices/backup network.” Only a few indicated using an approach wherein “every device connected to two independent networks.”

In 2010, 10 out of 21 respondents outside the U.S. and Canada (48%) indicated they were using “single network without failover” architecture for substation Ethernet LANs. Seven indicated some use of “single network with multiple paths/failover,” with four planning to use that architecture by YE 2013. Four utility respondents were using “independent primary devices/primary network and backup devices/backup network.” Only three indicated using an approach wherein “every device is connected to two independent networks.” Two reported that they are either “Currently in RFP phase to get a solution” or “To be determined.”

2010 Substation Ethernet LAN Architectures: North America



Maximum allowed failover/recovery time (in seconds) for network reconfiguration

Among North American respondents, the average maximum failover/recovery time allowed was 21 seconds in 2010. Fifteen utilities provided input. The range of responses was from one second to 120 seconds.

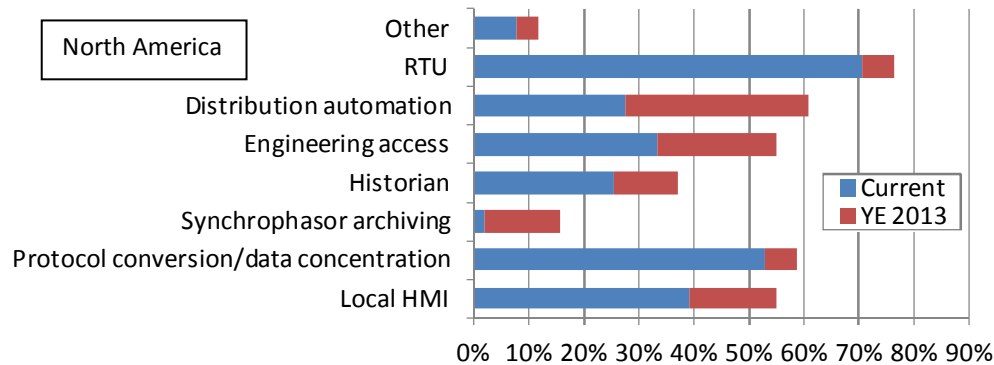
Internationally, the average maximum failover/recovery time allowed was 27 seconds in 2010. Fourteen utilities provided input. The range of responses was from 0 seconds to 60 seconds.

Applications for which substation-based computing platforms are used

In 2010, RTU data handling was the clear leader among North American utilities as an application device/manager. Protocol conversion and data concentration appeared to be the next leading applications requiring task handling or information processing inside the substation. Local HMI (human-machine interface) followed, with engineering access next in importance. The major change seemed to be the inclusion of additional distribution automation functionality and processing by year-end 2013, with even more engineering access to information processed in the substation.

Internationally, substation-based computing platforms were used for Local HMI by 80% of international utility respondents in 2010, followed by RTU applications (62%) and Protocol Conversion/Data Concentration (48%).

In 2010, North American Substation-based Computing Platforms Were Used For:



To pre-order this study in October and save \$1,500 off the list price, visit our reports page: <http://www.newton-evans.com/our-reports/>



New Report from Newton-Evans Emphasizes U.S. Know-How and Capacity to Forge a Modern Electric Power Grid

Study entitled “American Manufacturing and Systems Integration Capabilities for Power Grid Modernization” Provides Specific Guidance from Manufacturers and Systems Integration Firms concerning Readiness to Serve

Newton-Evans Research believes that American manufacturers can accommodate more rapid growth in U.S. grid modernization efforts than currently exists. Based on repeated surveys of several of the key manufacturing companies active in grid modernization product development and firms involved with grid management and control systems integration activities, there is sufficient manufacturing and integration capacity to meet expected demand levels for almost all core components of the smart grid investment grant program identified by the U.S. Department of Energy as well as additional grid modernization components studied by Newton-Evans Research Company. Additional grid modernization components include the intelligent electronic devices (IEDs) required for various automation projects from transmission and distribution level applications down to smart infrastructure equipment.

Regarding the nation’s ability to increase systems integration workloads and capabilities, there is sufficient integration expertise available to expand usage levels of the following: (1) dynamic transmission line rating systems; (2) synchrophasor-related monitoring systems used in the nation’s high-voltage transmission networks; (3) operational control systems deployed for power generation management, transmission and distribution network operations and outage management; (4) information technology with which to intelligently manage deployments of grid modernization components, including telecommunications and analytical tools.

Nationwide grid modernization efforts could be largely completed by 2040, including widespread deployment of a variety of scalable energy storage devices sited along the electric power delivery network and at customer premises, according to these observations and insights.

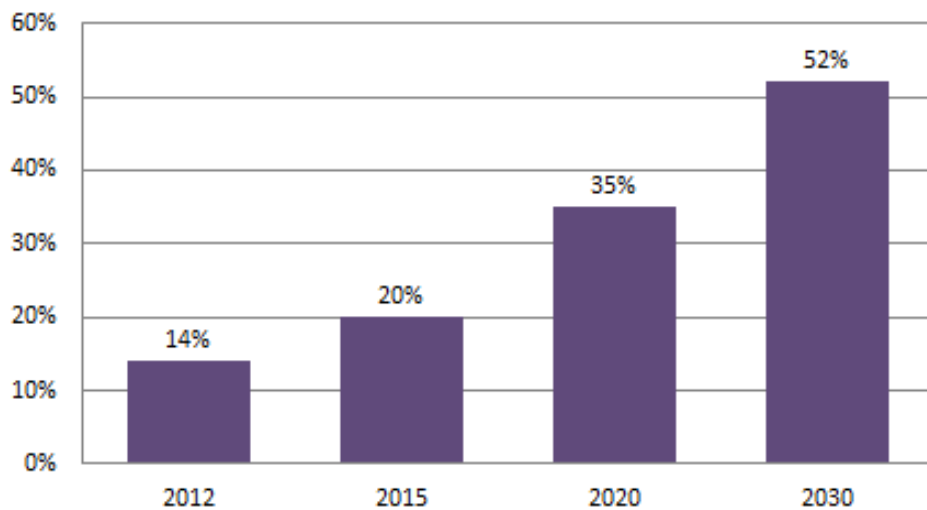
The core technologies identified as smart grid investment grant (SGIG) program components by DOE and discussed anew in this report are as follows: Energy storage, dynamic line rating (DLR), operational control and monitoring systems including SCADA and energy management, distribution management system, Advanced Distribution Automation (ADA) and outage management systems,

synchrophasors, advanced metering infrastructure, smart meters, home-area networks and smart electricity loads.

Additional grid modernization components considered in this study include substation modernization programs, protection and control activities, cyber security developments, time synchronization and a variety of grid infrastructure equipment.

Here are some excerpts from the study:

Automated Field Devices Rollout Timeline Projection



Newton-Evans Estimates as of Aug. 2013

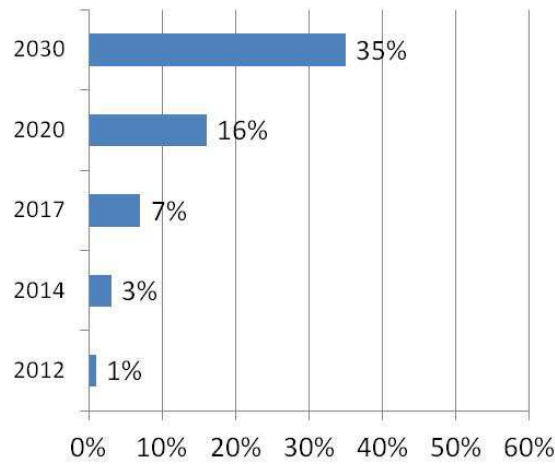
Dynamic Line Rating Systems: US Outlook for 2010-2030

Dynamic Line Rating Systems				
Head End Units			Line Units (sensors 69kV)	
Year	%	# of units	%	# of units
2012	5%	750	5%	3,900
2015	15%	2,250	15%	11,700
2020	35%	5,250	35%	27,300
2030	65%	9,750	65%	50,700
	100% =	15,000	100%=	78,000

Newton-Evans Estimates as of Aug. 2013

Energy Home Area Networkss For Consumers: Deployment Scenario 2012-2030

Energy HANs	
%	# of units
1%	1,440,000
3%	4,320,000
6%	8,640,000
10%	14,400,000
20%	28,800,000
100%=	144,000,000



Marginal Cost Analysis for Smart Grid Components

In the Newton-Evans’ surveys of and discussions with utility and industry officials, it is clear that marginal cost issues vary in importance among manufacturers and differ from the marginal cost concerns of integration firms.

The nation’s ability to meet expected increases in core smart grid manufactured technology is strong. The readiness to meet increased demand for various control systems is somewhat weaker and depends highly on specialized, skilled labor to write programs, train customers, integrate hardware and software, and install and test systems.

Manufacturing companies are in a good position to produce whatever may be needed in terms of units of products or equipment. Systems integration firms, however, are more limited by the number of trained and qualified technical workers who are available.

Research Findings and Mid-Year 2013 Observations cover the following:

- | | |
|--|---------------------------------------|
| Dynamic Line Rating (DLR) for Transmission | HAN – Home Area Networking |
| Synchrophasor Usage Patterns | Smart Appliance Loads |
| Energy Storage Units – An Issue of Scale | Substation Modernization Programs |
| Smart Grid Operational Control Systems | Protection and Control Equipment |
| Automated Field Devices for Advanced Distribution Automation | Cyber Security Developments |
| Automated Metering Infrastructure | Time Synchronization and Grid Control |
| Smart Meters | CAPEX Outlook for Grid Modernization |

The 41 page report is priced at \$975.00 and is available on our reports page. www.newton-evans.com/our-reports/



Knowledge 2013 Summit: Nov. 4-6

Charles Newton, President of Newton-Evans Research Company, Inc. is serving as the Operations Chairperson at the upcoming Knowledge 2013 Summit, Nov 4-6 2013 being held at The Broadmoor, Colorado Springs, Colorado.

Sponsored by Energy Central, the following conference information has been excerpted from their website at www.knowledgesummits.com

Designed to create community and stimulate dialogue, Knowledge2013 Utility Executive Summit gathers senior leaders in Customer Service, Operations, and Information Technology from top investor-owned, municipally owned and cooperatively owned utilities for two days of interaction and collaboration addressing the pressing topics most important to utility executives.

Topics selected for potential discussion at this year's conference by members of the Operations Committee include:

- *The New Distribution Toolbox: The Movement Towards Integrated DMS/DA/OMS/SCADA Operations*
- *Situational Awareness: Operational Tools for Future Operations*
- *Cyber Security: Securing the Grid in a Dangerous World*
- *The New Dynamics of Rate Structures: Regulatory Impact, New Metering, and Cost*
- *Recovery Operations*
- *Renewables Integration: It's Not Coming, It's Already Here*
- *Convergence of OT/IT – Ownership & Operationalization*

Operations Committee Members

Reza Alagheband, *Senior Operations Consultant, Austin Energy*

Stephen Cooper, *Director of Electric Systems Asset Management, JEA*

Lee S. Krevat, *Director, Smart Grid, San Diego Gas & Electric*

Michael Lamb, *Operations Chief of Staff, Xcel Energy*

Paul Lau, *Assistant General Manager of Power Supply & Grid Operations, SMUD*

Cal Morris, *Director of Engineering, Clark Public Utilities*

Charles Newton, *President, Newton-Evans Research Company (Chair)*

Thomas Pierpoint, *Group Mgr of Enterprise Applications, Pepco Holdings, Inc.*

John Romero, *GM, Acquisition, Eng. and Planning, Colorado Springs Utilities*

Joseph D. Thomas, *VP, Client Fulfillment & Electric System Ops., United Illuminating Co.*



Distributech 2014: A Look Ahead

Distributech 2014 takes place Tuesday through Thursday, January 28-30, 2014 in San Antonio, TX at the Henry B. Gonzalez Convention Center. Just like in years past, this conference will host hundreds of exhibitors and tens of thousands of attendees. Newton-Evans Research Company President Charles Newton will be a panelist on Wednesday's "Mega Session 5" to discuss the future of Smart Grid and Grid Modernization as the related technology is implemented around the globe.

Mega Session 5: Wednesday, Jan 29

A Global Look at Smart Grid's Progress and Future

Smart grid installations have been underway around the world for a number of years and lessons have been learned. The panelists in this mega session will present an overview of global market trends, an analysis of where smart grid stands and their predictions for its future, as well as share some experiences from projects around the world. They will discuss some of the lessons learned in real implementations, including investment experiences.

Panel Moderator:

Marco C. Janssen, CEO,
UTInnovation

Panelists:

Albert Cheung, Head of Energy Smart Technologies, Bloomberg
New Energy Finance
Charles Newton, President, Newton-Evans Research Co. Inc.
Heiko Staubitz, Senior Manager, GmbH Germany Trade and Invest

Download an Event Guide here:

<http://digital.pennwell.com/pennwellevents/dtechprelimguide2014>

Registration is now open! Visit the Distributech website:

<http://www.distributech.com/register.html>

