

Market Trends Digest

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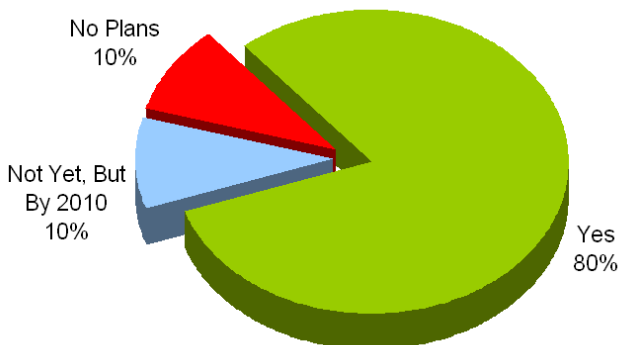
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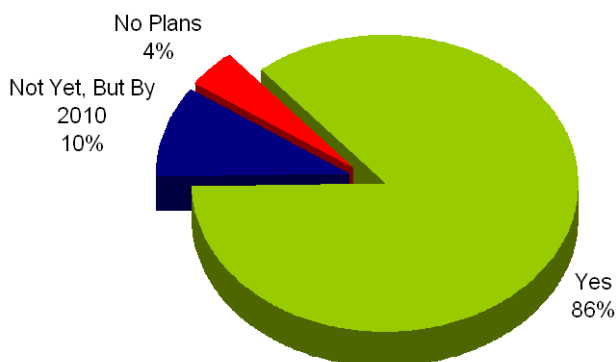
Summary Findings From 2008 Worldwide Substation Automation Study

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CURRENT SUBSTATION AUTOMATION AND INTEGRATION STRATEGY IN PLACE (North America)



CURRENT SUBSTATION AUTOMATION AND INTEGRATION STRATEGY IN PLACE (International)



The 2008 Worldwide Study Of Substation Automation And Integration Programs In Electric Utilities encouraged about as many survey responses as the 2005 study, both internationally and in the U.S. and Canada. Some of the trends observed over previous studies remain the same, but new questions added to this year's study provide some surprising new data to this 4 volume report series. What follows is a sample of summary-level findings from volumes one and two; comparisons can be made between North American and International survey responses.

DETERMINATION OF WHETHER A SUBSTATION AUTOMATION STRATEGY IS CURRENTLY IN PLACE: NORTH AMERICA FINDINGS. This year's study has observed that 81% of the 105 respondents indicated that their utility had by mid-2008 developed a "current substation automation and integration strategy." Ten percent had not yet done so, but expect do so by 2010. The remaining 10% had "no plans" to come up with a substation automation and integration strategy.

Public power utilities (principally municipally operated utilities) were somewhat less likely than the other subgroups to have a substation automation and integration strategy in place (73%), but were expecting to develop a strategy by 2010 (18%). Overall, the percentage of participating utilities that indicate having a strategy in place continues to climb, following a trend first tracked in the 2002 study.

DETERMINATION OF WHETHER A SUBSTATION AUTOMATION STRATEGY IS CURRENTLY IN PLACE: INTERNATIONAL FINDINGS. In the new study completed in October, 2008, 42 of 49 respondents (86%) from more than 30 countries indicated that they did indeed have a substation automation and integration strategy in place. The range of utilities indicating that they did have a strategy in place ranged from a low of 75% in the Middle East/African region to a high of 95% among European respondents.

Ten percent of the group stated that they would have a substation A&I strategy in place by year-end 2010. Two Asia-Pacific utilities reported having no plans underway for a comprehensive substation automation strategy.

RANKING OF IMPORTANCE OF "POTENTIAL OBSTACLES" TO IMPLEMENTING SUBSTATION AUTOMATION: NORTH AMERICA FINDINGS. For new substations, important changes have occurred in the perception of utilities regarding potential obstacles for implementing substation A&I programs for NEW substations. The principal finding this year is that the obstacles are all somewhat less important (perhaps less difficult to overcome) than reported in earlier studies.

The most important obstacles among all utilities were centered on (1) staff shortages, (2) lack of funding and (3) cyber security concerns. Investor-owned utilities emphasized cyber security concerns, followed by skilled staff shortages, communications issues (substation to substation) and a lack of funding. Public power and cooperative utilities were more likely to emphasize the shortage of skilled staff, and the Canadian respondents highlighted security concerns.

For existing (retrofit) substations, ninety-nine utility officials provided their responses to this second part of Question 2 in this year's survey. Note that retrofit carries a higher (but still moderate) relative scaling of the importance of obstacles. Clearly, the benefits perception and the funding issue dominate feedback from these officials.

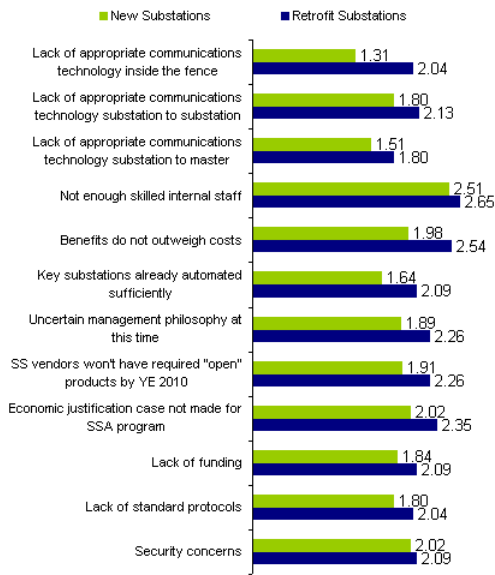
(Summary Findings Cont'd.)

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However, lack of skilled staff, economic justification, substation-to-substation communications issues and security concerns are also ranked as moderate obstacles among this group.

IOU respondents struggled with lack of funding and benefit perceptions for their programs. They also ranked security concerns higher than did their counterparts in other utilities. Public power officials cited a lack of funding and lack of benefits, with staff shortages at the top of their list, with another concern over uncertain management philosophy. Coops struggled with inter-substation communications issues and not enough skilled staff. Canadian utilities focused on the lack of benefits for retrofit programs and the concern for cyber security.

RANKING OF IMPORTANCE OF "POTENTIAL OBSTACLES" TO IMPLEMENTING SUBSTATION AUTOMATION BY YE 2010 (International)
(1=not an obstacle, 5=formidable obstacle)



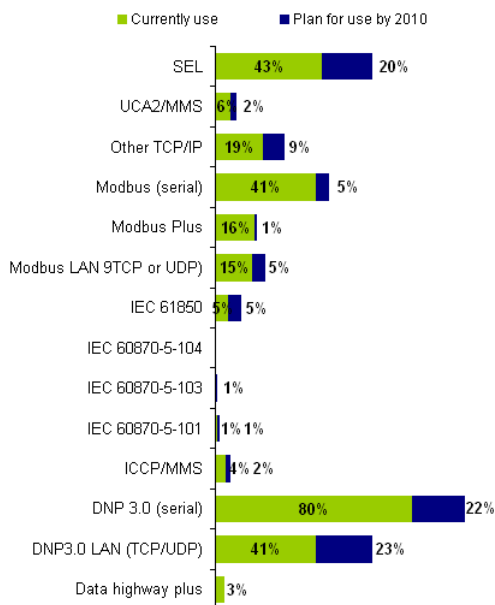
RANKING OF IMPORTANCE OF "POTENTIAL OBSTACLES" TO IMPLEMENTING SUBSTATION AUTOMATION: INTERNATIONAL FINDINGS. New Substations: Forty-five utility officials replied to this section of Question 2 concerning potential obstacles to implementing substation automation for new substations through 2010.

On a summary basis the obstacles are becoming relatively less important as time goes by. The major obstacle reported this year is the lack of skilled internal staff. This was the most important obstacle in each region of the world. Economic justification and concerns over cyber security issues were next in importance among the overall group of respondents.

Latin American officials tended to rank several potential obstacles as being slightly more important than did their counterparts elsewhere. Developing nations also ranked "lack of funding" higher than did the Western nations.

For retrofit substations, the officials reported once again the increased level of concern for potential obstacles for implementing automation on a retrofit basis in existing, aging substations.

CURRENT/PLANNED USE OF PROTOCOLS WITHIN SUBSTATION (North America)



There was significantly more importance placed on rankings for each of the twelve "potential obstacles" listed on the survey. That is to say that these obstacles are being viewed as stronger impediments to planning for a substation automation program for existing substations. Note: This pattern (more obstacles to automating existing substations) was true also for the North American study again this year.

Lack of skilled staff, lack of benefit perception, not making the economic justification case for automation and ongoing concern over vendor readiness were each cited as the more important among twelve listed obstacles to automating existing substations. Developing nations in Asia and Middle East and Africa tended to rank most of the listed obstacles as greater impediments than did their counterparts in other regions. The exceptions included European sentiment about lack of benefits over costs and European concern over vendors not having the required open substation IED products available by 2010.

CURRENT AND PLANNED USE OF PROTOCOLS WITHIN THE SUBSTATION: NORTH AMERICA FINDINGS. DNP 3 (serial) was once again observed as the most widely used protocol among the dozen-plus protocols listed on the survey. Eighty percent of the respondents reported at least some use of DNP 3 serial. SEL protocol, a newly listed option, was cited by a very substantial 43% of the group. Both DNP 3 LAN and Modbus - Serial received 41% mention rates.

Five percent cited some current use of IEC 61850, both a protocol, but more importantly a substation communications architecture. This is the highest level of IEC 61850 use yet reported in a North American market study.

(Summary Findings Cont'd.)

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Importantly, IOUs and large Canadian utilities were much more likely to cite some use of Modbus than were their counterparts in public utilities or in cooperative utilities. IOUs were also much more likely than other subgroups to be using SEL protocol, mentioned by 52% of IOU respondents.

CURRENT AND PLANNED USE OF PROTOCOLS WITHIN THE SUBSTATION:

INTERNATIONAL FINDINGS. The new study found that nearly one-half of the 45 respondents from 31 countries are using IEC 60870-5-103 in at least some of their transmission and/or distribution substations. Almost all usage of this protocol is occurring within the European region.

IEC 61850 protocol use has increased to a level of 40%, with 55% of European respondents indicating some level of current deployment of this protocol. Three of nine respondents from the Middle East and African regions indicated some current use of IEC 61850 as well, and more of the region's utilities planning to adopt some use by 2010.

DNP 3 is quite widely used outside of Europe. All ten of the Asia-Pacific utilities in the study reported use of DNP 3, as did 2 of 5 Latin American utilities and two of eight Middle Eastern utilities. Importantly, several of the current users of DNP 3 serial communications plan to migrate to a LAN version of this protocol.

Modbus is still used around the world as well, with one third of the respondents indicated current use. Usage was quite high among Middle Eastern and Asia Pacific respondents.

CURRENT AND PLANNED USE OF SUBSTATION SECURITY MEASURES: NORTH AMERICA FINDINGS. Eight optional responses were listed in response to this question on substation security methods and practices. Utilities were asked to indicate whether they were using or had plans to use any of the following: encryption of RTU communications, password protection for IEDs, video camera surveillance, improved intrusion detection, secure facilities, eye/fingerprint identification, and limited accessibility to substation-related keys. This year Newton-Evans added the eighth category of "substation firewall" to the list.

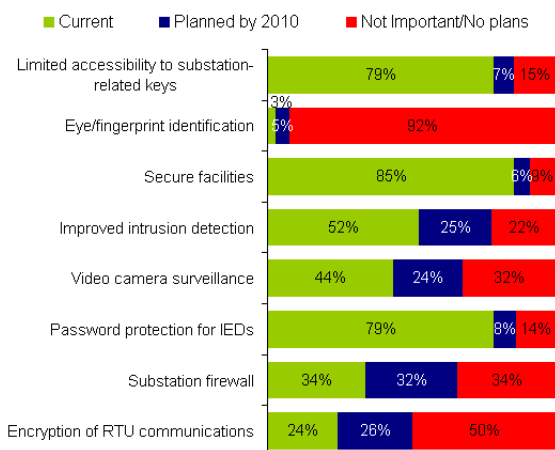
Even as late as mid-2008, only 24% of the officials from 103 utilities reported using encryption of RTU communications. Strong reliance on physical security measures (cited by 85% for locked buildings and enclosures and 79% reporting limiting access to substation keys) increased from the last study. Cyber security measures were led by use of password protection for IEDs (79%).

Plans for adding levels of security during 2008-2010 were centered on substation firewalls (32%), improved intrusion detection (25%) and video camera surveillance (24%). On average, each of the utilities represented has reported implementation of four of the eight measures listed. Cooperatives averages only about three measures, while other sub-groups had implemented (on the average) just over 4 of the measures.

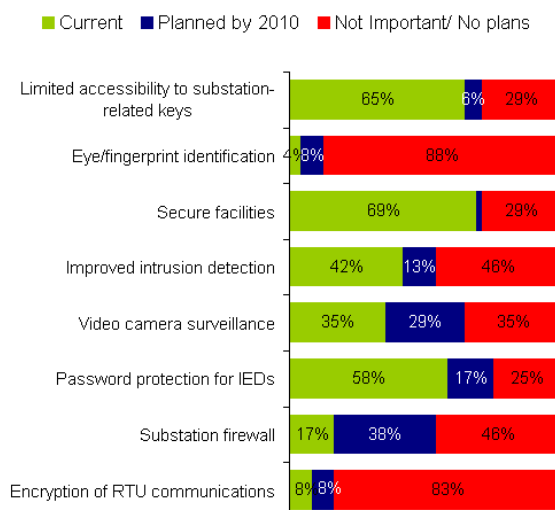
CURRENT AND PLANNED USE OF SUBSTATION SECURITY MEASURES: INTERNATIONAL FINDINGS. Eight optional responses were listed in this question on substation security methods and practices. International utilities were asked to indicate whether they were using or had plans to use any of the following: encryption of RTU communications, substation firewalls, password protection for IEDs, video camera surveillance, improved intrusion detection, secure facilities, eye/fingerprint identification, and limited accessibility to substation-related keys.

The most frequently cited security measures currently in use in 2008 included secure facilities (locked/gated buildings and enclosures), mentioned by nearly 70% of the respondents. Limited accessibility to substation keys was cited by about two-thirds of the group, while password protection for substation resident IEDs was mentioned by 58% of the respondents. Plans centered on adding substation firewalls and video camera surveillance over the 2008-2010 period.

CURRENT AND PLANNED USAGE OF SUBSTATION SECURITY MEASURES (North America)



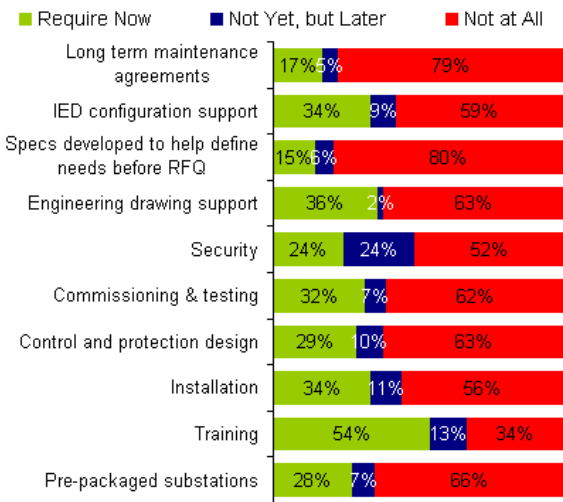
CURRENT AND PLANNED USAGE OF SUBSTATION SECURITY MEASURES (International)



(Summary Findings Cont'd.)

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EXTERNAL ASSISTANCE NEEDED BY UTILITY FOR SPECIFIC SUBSTATION AUTOMATION AND INTEGRATION-RELATED ACTIVITIES (North America)



EXTERNAL ASSISTANCE NEEDED FOR VARIOUS SUBSTATION AUTOMATION ACTIVITIES: (This question was asked of utilities in NORTH AMERICA only.) This question was asked to gain insight into what types of services could be provided by third-party firms, whether they are specialist service firms, or equipment or systems suppliers, into the substation marketplace. In this year's study, "security" assistance was added to the list.

Training services again led in importance (based on numbers of mentions) among this year's respondents (54% cited a need for substation-related automation training services). More than 30% indicated a current requirement for engineering drawing support, installation services, IED configuration support and commissioning and testing services.

Investor-Owned utilities indicated higher rates of current requirements for pre-packaged substations, training services, commissioning and testing and engineering drawing support than did their counterparts in other types of utilities. Among services required "not yet, but later" "security" led in mention frequency (24% of the respondents across all utility types cited this).

For more details, or to order this report series, visit our website at www.newton-evans.com and click on "Our Reports."



Where T&D Automation Is Headed: 2009 and Beyond

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The financial environment and economic outlook darken many segments of the national and global economies. Will the electric power industry significantly scale back planned capital expenditures and operations and maintenance spending on transmission and distribution automation? To find the answer, we conducted a global study of capital-expenditure budgets.

Several key reasons underpin the continued relatively strong investment in transmission and distribution of electricity planned for 2009 and 2010. Regulatory pressure and mandates for service reliability improvements require investment. Smart-grid initiatives aimed at modernizing the power grid infrastructure and enabling energy efficiencies need funding. Obsolescence of existing equipment and systems obliges utilities to buy replacements. Also, a long-term investment view is necessary to accommodate long-term growth in electricity consumption. Many utility capital projects are complex and require years to complete, so project deferrals are often impossible, despite a poor economic outlook.

A market segment that includes distribution management software and energy management systems, such as supervisory control and data acquisition, is nearing global sales of \$500 million annually, excluding turnkey control center projects. Some uptick in spending is possible for new applications software and better visualization tools to compensate for aging, installed systems. Sales of the closely aligned outage management technology will grow. Sales of outage management software and platforms are nearing \$100 million, led by Oracle Utilities, Intergraph and MilSoft.

The market for substation intelligent electronic devices for new communications implementations and integration has grown to nearly \$500 million. Multiyear programs aimed at upgrading, integrating and automating an existing global base of a quarter-million transmission and primary distribution substations have been under way for some time. Some programs launched in 2008 will continue into 2011. Spending growth will continue more slowly for critical substation automation and integration programs. High-voltage transmission substations will have the first priority for upgrades and the addition of more intelligent electronic devices.

Many industry observers, utility officials and regulators in the United States, Canada, Australia and Western Europe see automated meter reading as the smart grid's lynchpin. Nearly 93 percent of 1.5 billion electricity meters installed worldwide are electromechanical; thus, smart metering interests utilities in Indonesia, Russia, Honduras, Malaysia and Thailand. The prepayment smart meter is taking hold in some developing nations. The combined resources of Itron, coupled with its Actaris acquisition, make it the global-share leader in sales and installations of AMI and AMR systems and meters.

The global market for protective relays, the foundation for protection and control, has climbed well above \$1.5 billion. Spending in 2009 for protective relays is unlikely to drop, because these devices continue to expand in capabilities and undertake additional functions, such as sequence-of-event recording, fault recording and analysis, even acting as a remote terminal unit. The North American leader in relay sales to utilities is SELEL, while GEGE Multilin holds a slight edge serving industrial markets. The Institute of Electrical and Electronics Engineers defines distribution automation as "a system that enables an electric utility to remotely monitor, coordinate and operate distribution components in a real-time mode from remote locations."

Today, distributed automation can encompass any aspects of a distribution network automation scheme, from the control center-based SCADA and distribution management system to the substation, where remote terminal units, programmable logic controllers, power meters, digital relays, bay controllers and myriad other communicating devices help operate, monitor and control power flow and measurement in the medium-voltage ranges.

Nonetheless, the primary and secondary network is where we find reclosers, capacitors,



(T&D Automation Cont'd.)

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pole-top RTUs, automated overhead switches, automated feeders, line reclosers and associated smart controls. These new smart devices are the basic building blocks for distributed automation. The objective will be achieved with the ability to detect and isolate faults at the feeder level, and it will enable ever-faster service restoration. With spending approaching \$1 billion worldwide, distributed automation implementations will continue to expand during the coming decade, nearing \$2.6 billion in annual spending by 2018.

The transmission and distribution automation market won't go away in 2009, nor will it shrink, based on our firm's latest electric utility budget studies. When telecommunications infrastructure developments are included, about \$5 billion will have been spent in 2008 for global T&D automation programs. T&D automation spending growth is likely to be subdued in 2009 and perhaps 2010. However, the global market for T&D capital-expenditure investment will approach \$105 billion. Capital spending is likely to remain at or near current levels of spending for 2009 and part of 2010, benefiting from the continued regulatory-driven momentum for advanced metering infrastructure, renewable portfolio standards and demand response initiatives. By 2012, we should once again see healthier capital expenditure budgets, prompting overall T&D automation spending to reach about \$6 billion annually while total investment reaches well over \$100 billion.

ELECTRIC POWER UTILITIES PLAN TO "HANG TOUGH" WITH PROJECTED CAPITAL SPENDING PLANS. The views of more than 100 leading utilities in 35 countries remain largely upbeat for continued investment in infrastructure and automation projects. In spite of the weak economic conditions in countries around the world, electric power utilities appear to be proceeding with their infrastructure and automation programs. Most of these public and private utilities are poised to continue their long-term capital investment programs as had been originally planned earlier this year.

In a new study completed by Newton-Evans Research in January, a significant majority of the 100+ officials from more than 35 countries participating in the study indicated that capital spending for control systems, substation automation, smart grid-related programs, distribution management, advanced metering rollouts, and infrastructure equipment for transmission and distribution grids will remain as originally projected a year ago. The one area with the most significant downward change in capital expenditures was "distribution infrastructure." On the upside were increases for AMI initiatives and for new or upgraded control systems. The total amount of capital spending for transmission and distribution of electricity by electric power utilities around the world is estimated by Newton-Evans to be in the range of \$90-\$110 billion this year. The 2009 outlook overall is trending toward that same range of spending.

Four key reasons for the continued relatively strong investment in transmission and distribution are: 1) regulatory pressure and mandates for service reliability improvements; 2) smart grid initiatives aimed at modernizing the power grid infrastructure and enabling energy efficiencies; 3) obsolescence of existing equipment; and 4) long-term investment view being necessary to accommodate future growth in electricity consumption. Frequently, utility capital projects are complex and multi-year in nature, so project deferrals are often out of the question.

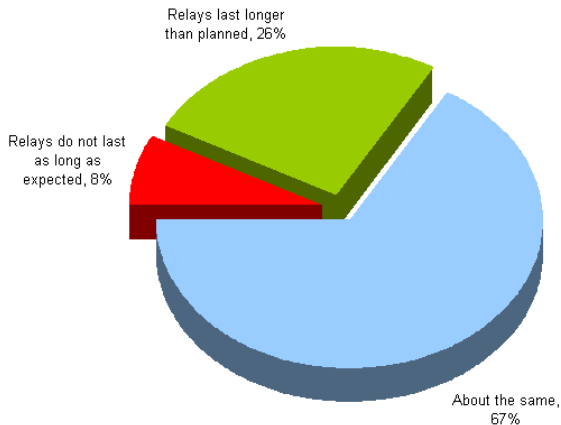
The study includes feedback sections on investment plans for seven key areas and is further detailed by world region and by utility ownership type and size. Operations and maintenance budget plans are also reviewed. The 40-page report is priced at \$325.00, can be ordered online and is available in pdf format.

Additional information about the report "Global CAPEX and O&M Expenditure Outlook for Electric Power Transmission and Distribution Investments: 2009-2010" is available from the Newton-Evans Research Company's web site (www.newton-evans.com), or by e-mail (eleivo@newton-evans.com or eforrest@newton-evans.com), or by telephone at 1-800-222-2856.

Newton-Evans 2009 Global Study of the Protective Relay Marketplace in Electric Utilities

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Correlation between planned life expectancy and actual life expectancy of digital relays



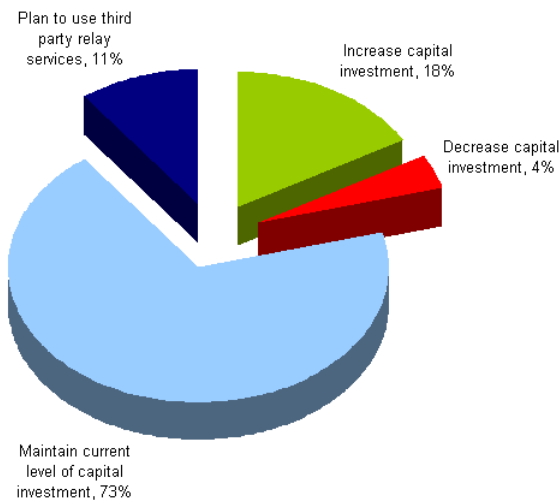
Newton-Evans Research Company is now conducting its eighth study of the worldwide protective relay marketplace. If you are a utility representative or engineer who would like to participate in this study in exchange for the Executive Summary Report of our findings please send an email to Jeff@newton-evans.com with the subject line, "Protective Relay Study Request." If you are interested in purchasing this report series, check our website for release date notification in April/May.

Early results from the first 45 respondents to our survey indicate that—excluding motor and generator protection—between 75% and 93% of new relay purchases in upcoming years will be digital and not electromechanical. This is not surprising since about half of the installed base for protective relays in this sample is already digital. Also, 73% of respondents plan to maintain the same level of capital investment for relay testing equipment, software and training, while only 4% seek to decrease it, 18% plan to increase it, and 11% plan to use third party relay testing services.

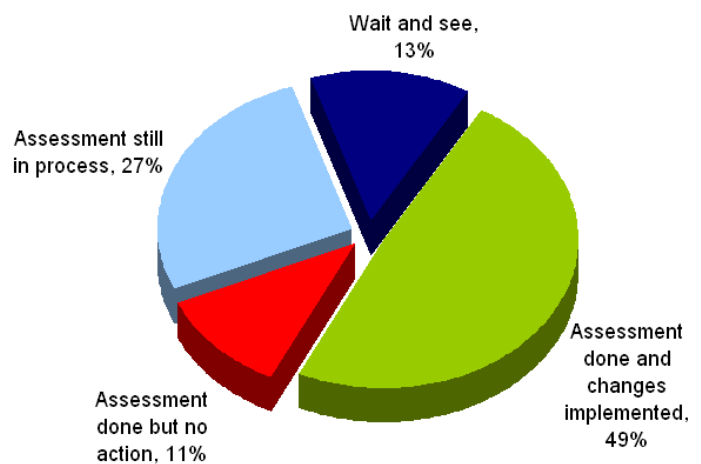
When it comes to the amount of life expectancy planned for relays, 26% of the first 45 respondents say that relays last longer than planned. Sixty-seven percent claim that life expectancy for relays lasts about the same as planned for, and 8% reported that relays do not last as long as expected. Additionally, 86% said that instead of having a plan in place to replace digital relays, they replace them as needed or as they cease to operate.

For more information on this study visit the Newton-Evans Research Company web site (www.newton-evans.com), or send an email to eleivo@newton-evans.com or eforrest@newton-evans.com. Contact us by phone at 1-800-222-2856.

Level of capital investment for relay testing equipment, software and training (North America)



Status of compliance with the January 1, 2009 deadline of IEEE standard NESC-2007



Global Smart Grid and Information Technology Expenditure Outlook

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Newton-Evans staff has examined the current outlook for smart grid-related expenditures and has made a serious attempt to avoid double counting potential revenues from all of the components of information systems spending and the emerging smart grid sector of utility investment.

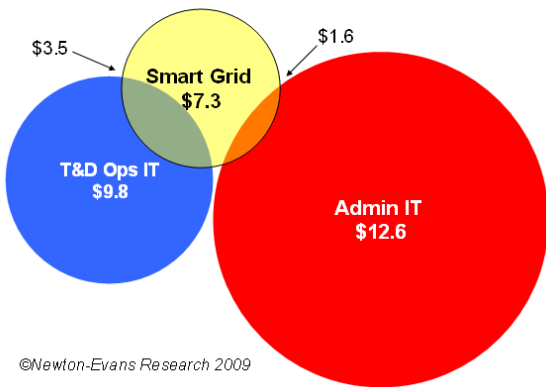
While the utility enterprise-wide IT portions (blue and red segments) of the chart below includes all major components of IT (hardware, software, services and staffing) the “pure” smart grid components tend to be primarily in hardware, in our view. Significant overlap with both administrative and operational IT supporting infrastructure is a vital component for all smart grid programs underway at this time.

Between “traditional IT” and the evolving smart grid components, nearly \$25 billion will likely be spent this year by the world’s electric utilities. Nearly one-third of all 2009 information technology investments will be “smart grid” related.

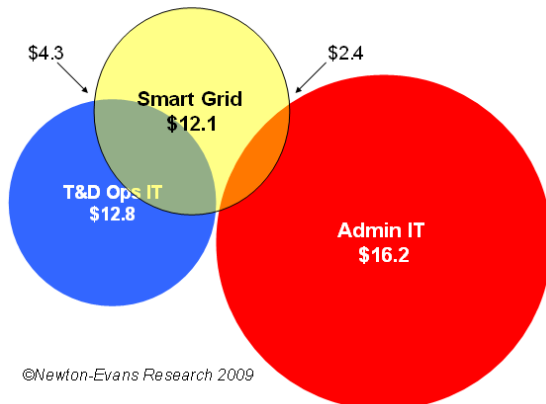
By 2013, as shown below, the total value of the various pie segments is expected to increase substantially, with “smart grid” spending possibly exceeding \$12 billion. While this amount is generally understood to be conservative, and well under the totals forecasted by other firms, we will stand by our forecasts, based on 31 years of history with electric power industry research.

What other sources may include in smart grid is the total value of T&D capital spending, which is already approaching \$100 billion globally, and will likely top \$120 billion by 2013. Clearly, all new procurements of infrastructure equipment will be made with an eye to including as much “smart” content” as is available from the manufacturers and integrators. What we are limiting our definition to is “edge” investment, the components of the 21st century digital transport and delivery systems being added on or incorporated into the building blocks (power transformers, lines, switchgear, etc.) of electric power transmission and delivery.

Global Smart Grid and IT Expenditure Outlook for 2009 In Billions of US Dollars



Global Smart Grid and IT Expenditure Outlook for 2013 In Billions of US Dollars



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