



Newton-Evans Research Company's

# Market Trends Digest

*January 2017*



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# Worldwide Protective Relay Marketplace

*Findings from Newton-Evans' 2016 study of protective relay trends in the world's electric power utilities depict a receptive market for incorporating advanced technological capabilities: role of synchrophasors and teleprotection continues to expand; provides better situational awareness and visualization for control system operators.*

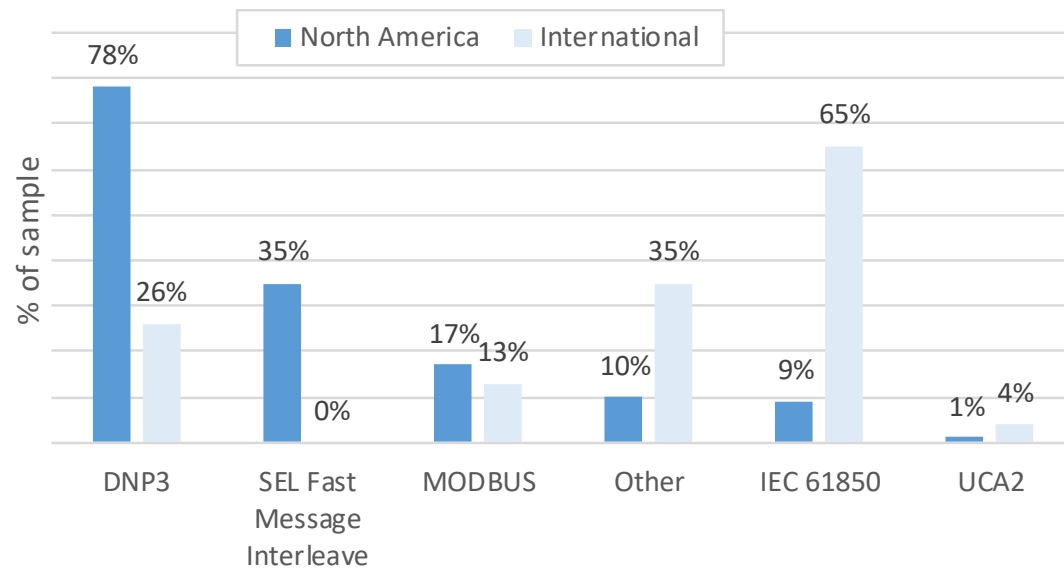
In December of 2016, Newton-Evans Research Company completed a six-month research study and survey of protective relay usage patterns in the world community of electric power utilities. Findings from 114 large and mid-size utilities in 28 countries point to some newer trends in adoption and use of protection and control technology.

Among the key findings reported in the four-volume study are these:

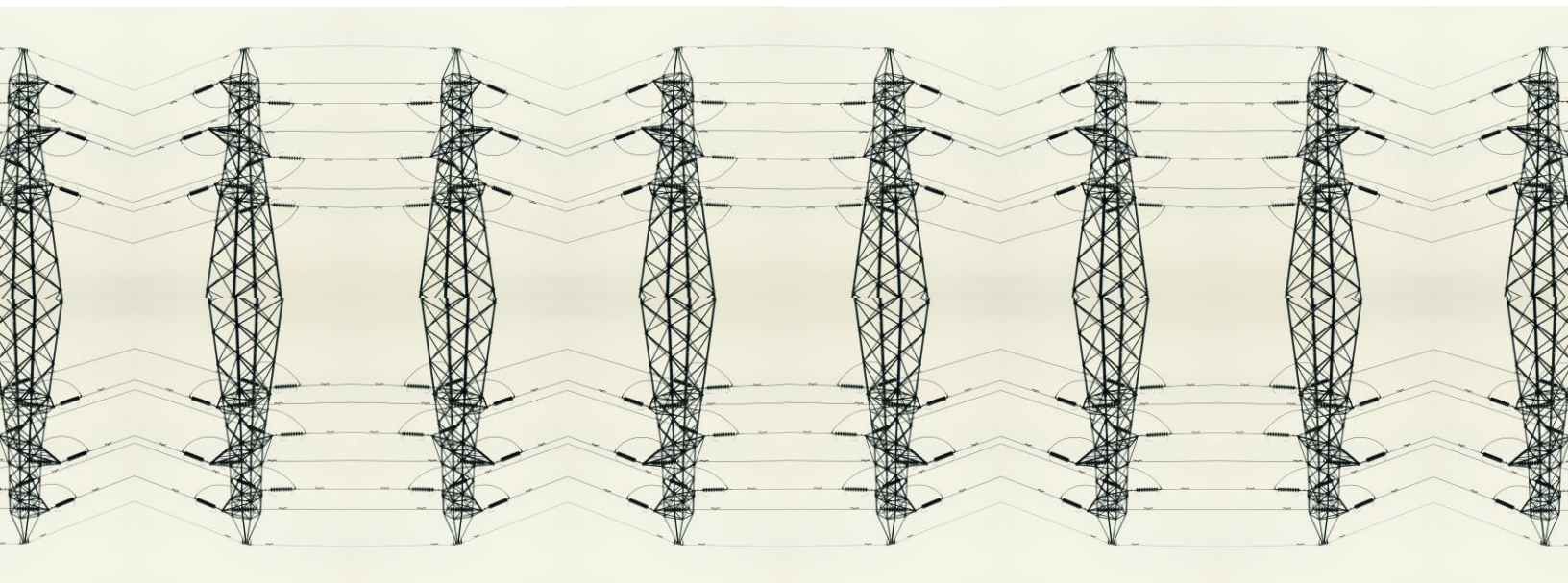
- Most new and retrofit relay units being purchased are digital relays, but in some of the protection applications studied, such as motor protection and large generator applications, and in installations where electrical interference is strong, electro-mechanical and older solid state relays continue to have a niche market position.
- The annual world market for protective relays and related power systems protection devices continues to grow at a moderate pace that exceeds many other categories of electric utility investments for grid modernization.
- Manufacturers of protective relays continue to expand their market coverage, with more than 20 firms each enjoying at least some share of the global market.
- Real-time analysis of synchrophasor data is becoming a major application for the emerging field of operational analytics.
- Communications protocol usage patterns continue to serve as a key differentiator between large and mid-size North American electric utilities and their international counterparts, as shown in the accompanying chart

The 2016 Newton-Evans survey of electric utilities includes more than 20 detailed product functionality topics, related technical questions, and market-related issues, together incorporating more than 250 data points of information from each of the participating utilities.

### Protocol Usage Patterns - Substation Automation (Mid 2016)



Further information on the research series *The World Market for Protective Relays in Electric Utilities: 2016-2018* is available from Newton-Evans Research Company, 10176 Baltimore National Pike, Suite 204, Ellicott City, Maryland 21042. Phone: 410-465-7316 Email: [info@newton-evans.com](mailto:info@newton-evans.com) or visit our website for additional information: <http://www.newton-evans.com/relaymarketplacestudy2016-2018>



# **SCADA, Energy Management Systems, Distribution Management Systems and Outage Management Systems in Electric Utilities: 2017-2019**

The Newton-Evans Research Company has released preliminary findings from its current study of EMS, SCADA, DMS and OMS usage patterns in North American electric power utilities, one of four component reports of the company's global market assessment series on operational control systems.

Preliminary findings from this study point to continuing development on EMS, SCADA, DMS and OMS capabilities during 2017-2019 among North American electric power utilities. Emphasis is being placed on upgrading currently installed systems.

Initial observations gleaned from interviews and surveys with over 60 officials from a broad range of U.S. electric utilities include:

- Plans call for upgrades or retrofits to SCADA and OMS systems among a large percentage of these utilities
- Plans for procurements of new DMS are significant, with about 20% planning to purchase a new or replacement DMS. Thirty percent indicated that they have or plan on having an Advanced DMS by year-end 2019.
- Nearly one-half of these respondents reported having real-time linkages between SCADA and outage management systems.
- Third party services are being used and relied upon to assist with NERC CIP compliance issues and for the conduct of vulnerability assessments.
- DNP 3 continues to be the most prevalent operational data communications protocol throughout North American electric power utilities. Plans call for continuing the use of DNP 3 for the foreseeable future among most of these utilities.
- The major use of analytics tools currently is in outage management activities such as fault location

More topics surveyed in this new study include: the impact of NERC CIP compliance on budgets and workloads; cyber security issues; telecommunications strategies and methodologies; distribution network model maintenance; changing organizational responsibilities for control systems; budget outlooks; and, DMS applications usage patterns.

There have been some important changes over the last few years in utility organizations responsible for control systems with IT departments now the principal support group in nearly one-third of these utilities, while 47% report the “OT” organization continuing as the primary support unit. Eighteen percent cited a shared responsibility (OT and IT).

*Is the support group for EMS/SCADA/DMS part of your corporate IT department, or is it managed by the line of business?*

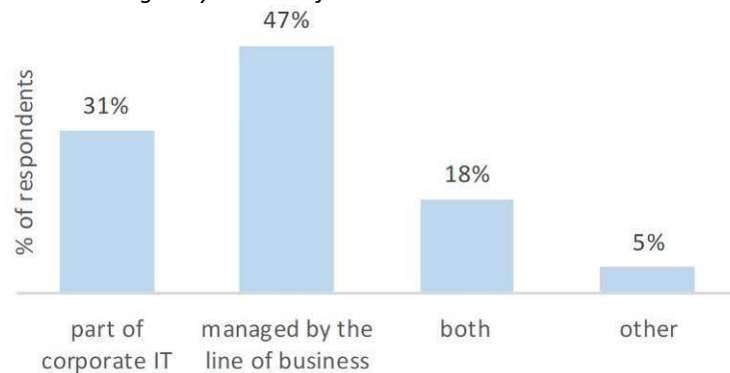


Fig. 1

The types of networks used for data communications from the substation to the control system vary widely, with utilities reporting use of multiple types of networks for the mix of data acquisition requirements.

*What types of networks do you use for communication from the substation to the external EMS/SCADA/DMS host/network?*

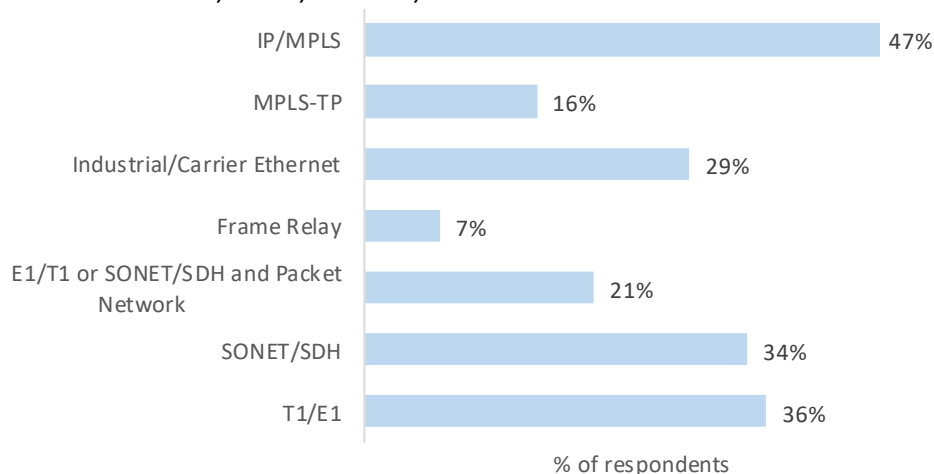


Fig. 2



The North American report is one of four volumes being produced for the company's fifteenth bi-annual series of EMS, SCADA and DMS studies published by Newton-Evans Research since 1984. Work on the other three volumes is underway; the entire series will be published during the first quarter of 2017.

*Further information on this new series The World Market Study of SCADA, Energy Management Systems, Distribution Management Systems and Outage Management Systems in Electric Utilities: 2017-2019 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](http://www.newton-evans.com). For readers interested in purchasing this new series please call or email [info@newton-evans.com](mailto:info@newton-evans.com) for special introductory pricing.*



# **Consulting Services Needed for NERC CIP, Operational Tech, Metering**

In 2016 Newton-Evans collaborated with electric utilities, engineers, consultants and service providers to estimate the North American market for Strategic Consulting, Project Delivery, and Staff Augmentation consulting services within the realms of Operations Technology, Metering, and NERC CIP. Information was gathered via online surveys, phone interviews and email exchanges with buyers and sellers of such services.

The survey asked utility officials to indicate:

- For Operational Technologies: spending on consulting services for strategic, project delivery, and staff augmentation
- For Metering-related assets such as automated metering, meter data management, demand response: spending on consulting services for strategic, project delivery, and staff augmentation
- Consulting firms doing business in all of these market areas
- Interest in various types of NERC CIP consulting services

## **OT Consulting Market**

Observations based on utility findings, consultant inputs, extensive secondary research – including correspondence and conversations with consultants and systems integrators – strongly suggest that the U.S. market for electric utility expenditures for third party OT consulting services are in the range of \$124-\$176 Million, centered on \$150 Million. Metering/demand response consulting services continue to hover in the \$45-\$50 million range with little growth at this time, while cybersecurity-NERC CIP consulting is now estimated at \$50-\$55 million and growing each year.

The value of systems procurements and upgrades related to OT including control and monitoring systems, and cybersecurity-related software products geared to NERC CIP compliance amount to nearly one billion dollars. This would mean about 12%-15% of the procurement budgets for OT systems are allocated for consulting activities.

## **Independent Consultants**

Newton-Evans believes there are two major breakouts of the consulting services available to utilities today. These are “truly independent” T&D and OT consultants comprised of three tiers of providers:

- Tier One firms have multiple large utility clients and have revenues in excess of \$15 Million.
- Tier Two providers have multiple clients, some specialization, and have revenues above \$10 million.
- Tier Three providers tend to be regional or local in nature, serving neighboring utilities with a range of capabilities.
- Together these firms earn at least \$88 Million annually from OT-related consulting services to utilities and ISO/RTOs.

### **Grey Market Consultants**

There is also a significant use of “grey market” consultants in the OT consulting arena. Together, these grey market providers earn at least \$62 Million from utility and ISO/RTO clients.

Companies that supply OT systems, software or services, and others that construct OT-related facilities also provide related consulting services. Often these services are provided “gratis” as part of capital procurements, or are subsidized by the consulting services provider looking to win a contract for a larger opportunity.

Included in the grey market for consulting services are these four segments:

- Consulting units of A&E/EPC firms (Black & Veatch, Burns & MacDonnell, many others)
- Systems integrators (GE-Alstom, ABB-Ventyx, Siemens, ACS)
- OT software developers/providers (Oracle, SAP, CAP-Gemini, IBM)
- VARs that educate customers and serve as a distribution channel for systems and software firms to smaller utilities (HD Electric, Irby)

### **“Which of the following NERC CIP consulting services do you think your utility might require from an outside consulting firm either now or by 2017?”**

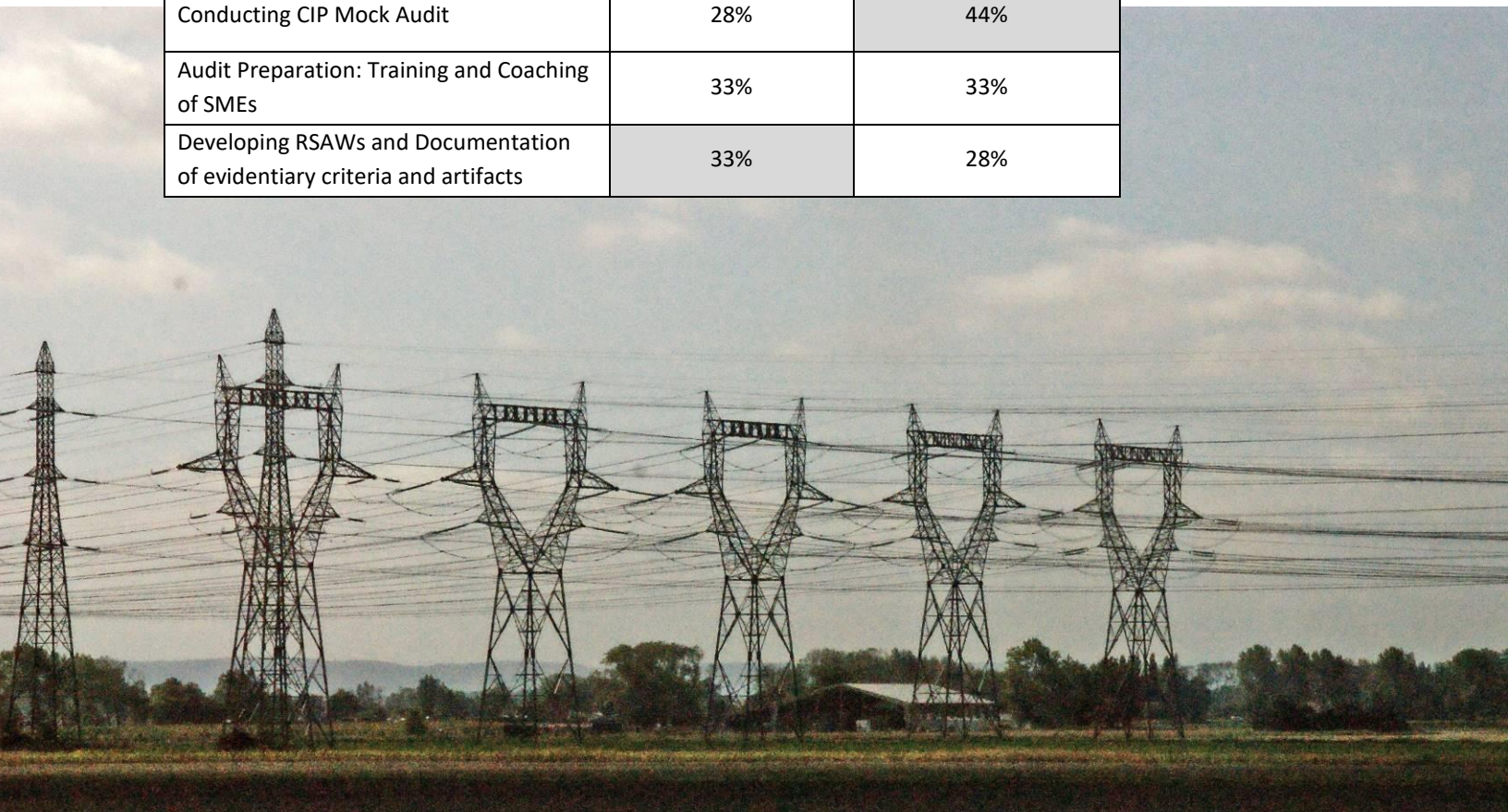
Respondents indicated a current year need for several categories of NERC-CIP-related actions. The conduct of CIP compliance assessments was reported to be needed by more than 60% of the group, while performing BES cybersecurity asset/system classification was cited by 44% as was the analysis of organization policy, process and procedural support of compliance.

By 2018, the focus for using consultants will shift to conduct of CIP mock audits, conducting GAP analysis, planning and execution of gap remediation projects, conducting NERC CIP vulnerability assessments and development of a CIP recovery plan.



*Which of the following NERC CIP consulting services do you think your utility might require from an outside consulting firm either now or by 2017?*

	Required now	Not now, will likely be required by 2018
Analyzing organizational policy, process and procedure support of compliance	44%	17%
Creating a phased roadmap to achieve compliance with changes in regulations	33%	22%
Performing BES Cybersecurity Asset/System classification	44%	17%
Establishing internal compliance review processes and schedules	39%	28%
Creating quarterly reporting processes and content	33%	22%
Conducting GAP Analysis	39%	39%
Conducting CIP Compliance assessment	61%	33%
Planning and execution of Gap Remediation projects	17%	39%
Conducting CIP Vulnerability assessment	39%	39%
Developing a CIP recovery plan	22%	39%
Conducting CIP Mock Audit	28%	44%
Audit Preparation: Training and Coaching of SMEs	33%	33%
Developing RSAWs and Documentation of evidentiary criteria and artifacts	33%	28%

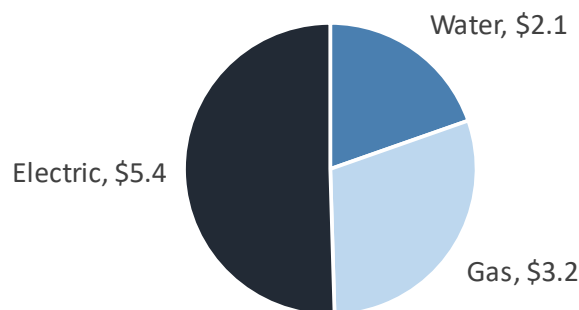


## Observations On The Metering, AMI & Telecommunications Market

As of the fourth quarter of 2016, the global demand for smart meters and the accompanying telecommunications infrastructure continued to increase, but at a more moderate pace than was the case just a few years ago. Global demand was led by good increases from developing nations as well as some growth reported in shipments to several European and North American utilities.

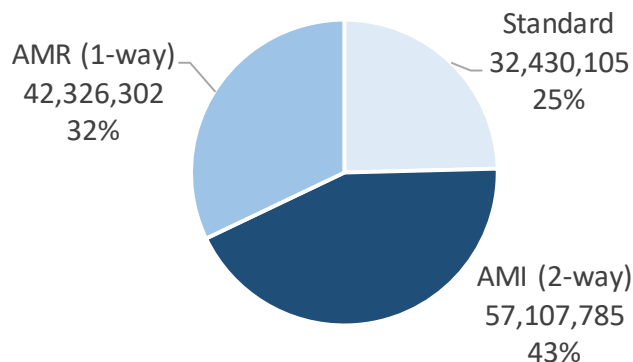
It is likely that the 2015 global market for meters, AMI programs and related telecommunications costs exceeded \$10 billion. Newton-Evans estimates stand at \$10.7 Billion - about eight-to-ten percent lower than at least one major research firm's estimates as reported in ITRON's 2015 Annual Report. 2016 shipment totals are not yet finalized but are likely to be approaching \$10.9 Billion, in our view.

*Estimates for 2015 Global Market for Metering Equipment and Telecommunications (\$Billion USD)*



*Fig. 1*

*U.S. Residential Electric Meter Population By Type of Meter  
(Source: [http://www.eia.gov/electricity/annual/html/epa\\_10\\_10.html](http://www.eia.gov/electricity/annual/html/epa_10_10.html))*

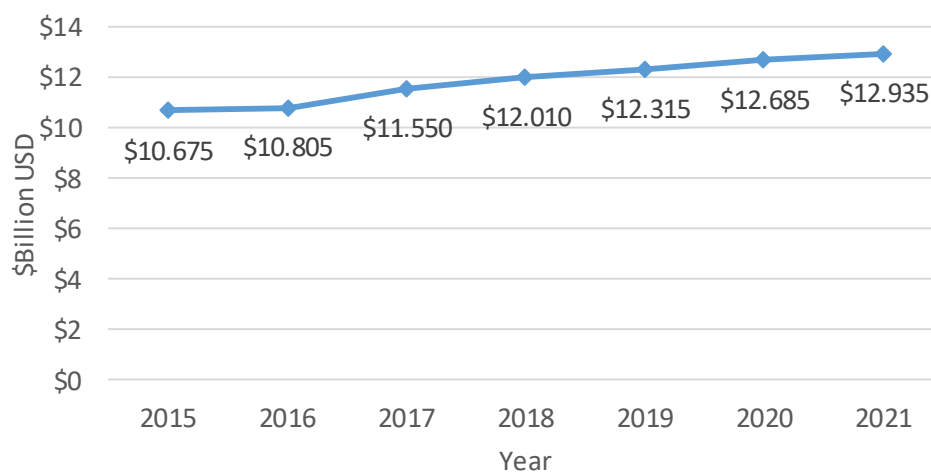


*Fig. 2*

Newton-Evans believes the overall growth rate for combined meter unit shipments will range from 2.4% to 2.9% over the 2017-2020 years. (See Fig. 3)

Newton-Evans estimates the electric meter portion of all utility metering shipments to currently account for just over one half of the total shipments. By 2020, Newton-Evans expects to see water and gas meters together accounting for just over one half of all unit shipments.

*Global Outlook for Residential Electric, Gas, and Water Metering -  
Combined Revenues for Meter Unit Shipments and AMI Telecommunications 2015-2021*



*Fig. 3*

The meter manufacturing industry can be described as fragmented, certainly on a global basis, if not a regional basis. See the following table that suggests that there are no dominant global market participants in either electric, gas or water metering. However, there are a few companies with some smart meter market shares in each of these segments. The multi-segment leaders include Itron and Elster, with France's Sagemcom also active in each market segment. There are several firms that are share leaders in two of the three segments, including Landis & Gyr and Sensus. Chinese and Indian manufacturers tend to concentrate in one utility segment, with several firms being quite strong share leaders within their home country markets and successfully export to price-sensitive markets in the Middle East, Africa and South Asia.

The TOP 10 share leaders together comprise much of each utility market segment, but this still leaves significant remaining market shares and selling opportunities available to other smaller manufacturers.

*Utility Metering – Market Share Leaders*

Utility Type	TOP 10 Metering Manufacturer Shares	Remaining Shares to Other Meter Manufacturers	Top Share Leaders
Electric	53%	47%	L&G, ITRON, Holly, Jiangsu Linyang, Wasion, EDMI, Elster, Siemens, Genus, HWE, Aclara
Gas	62%	38%	Elster, ITRON, Chongging-Shancheng, Dandong Dongfa, Qianwei Krommschroder, L&G, Sensus, Sagemcom
Water	57%	43%	ITRON, Elster, Ningbo, Diehl, Jianxi Sanchuan, Sensus, Zenner, Lian Li, Mueller, Neptune

