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The Business Case for Smart Metering

Preface

Providing excellent customer service, reducing operational costs, and increasing operational efficiency are utility business imperatives. However, in the ever-changing environment of deregulation and in a volatile world economy, metering solution suppliers have found that meeting utility requirements for a robust, high return on investment (ROI) advanced metering system is a difficult proposition. With new technological advances and the heightened need for utilities to perform like never before, the advanced metering business is becoming a smart business choice for both technology supplier and utility technology end-users.

This Aberdeen Group *Profile* takes a close look at the case for smart metering and highlights one company, SmartSynch™, whose wireless meter reading hardware and intelligent metering software provide the strongest case yet for advanced metering in utility commercial and industrial accounts.

The Advanced Metering Conundrum — Resolved

Electric utilities have sought cost-effective methods of addressing automated meter reading (AMR) and power quality and power reliability reporting solutions for more than 20 years. Despite the billions of dollars invested in research and development today, less than 6% of the total U.S. electric meter installed base resides on networked AMR.

The highest barriers to broadly accessible AMR and power quality and power reliability data have been the price and performance of available technology options. Many technology solutions available in today's marketplace are capable of delivering reliable AMR and power quality and reliability information, but at very high bundled costs. A typical AMR solution can easily average between \$700 and

\$1,500 per metering point and an additional \$50 to \$75 per year in maintenance and data acquisition costs. Add to these new infrastructure expenses the costs of deployment, implementation, and business process realignment, and the conventional utility automated meter reading proposition becomes economically unfathomable.

The need and desirability of AMR and power quality and reliability solutions for utilities is nearly ubiquitous. So, too, is the need for increased utility revenue, better customer service, and more efficient and capable utility operations. In the past, the costs of AMR and power quality have been gross limiting factors in utility adoption of AMR, but today's limiting factors have more to do with a misunderstanding of the economics of AMR and power quality solutions than with the costs of the solution. Today's advanced metering technology provides real business and operations benefits plus measurable ROI for utility companies.

The Business Case for Smart Metering

While advances in technology have been the primary driver for rationalizing the business case for smart metering, it is not the case that "any old" advanced meter reading technology will meet the stringent utility operations and economic tests for effective, efficient, material ROI meter reading.

Though it is difficult to generalize about a single set of requirements that make for such a metering solution given the variety of market requirements determined by factors — including the progress of deregulation, the mix of customers within a utility service territory, the financial strength and resources of the utility, and the state of utility legacy IT (Information Technology) infrastructure — it is clear that metering technology providers must provide metering *solutions* not just metering technologies. That is to say that metering hardware, network and system management software, and professional services consulting and integration are required pieces or integers of a solution value equation that are not divisible if a metering solution supplier is going to have a product that can be successfully sold to utilities.

Until the launch of companies like SmartSynch, which is based in Jackson, Mississippi, many so called "metering solution" providers were clearly lacking such a "metering solution" that fits this critical definition. Even companies that do possess all of these solution integers find it difficult to sell metering solutions to utilities because, in some way, the solution falls short of a utility's technological performance expectation or fails to deliver material ROI. In other words, the business case for a successful metering solution exists, but at this stage in the market it is a very specific business case.

Technologically speaking, today's successful metering solution must have the following:

- Metering hardware that fits under the glass;
- 24×7 reporting capability — even during a grid outage; and
- Robust wireless or other telephony connectivity for the meter and meter system management technology.

SmartSynch has already developed such a system — the SmartMeter System — and is currently in the process of deploying the solution at an installed cost of less than \$700 to \$1,000 per point, with yearly maintenance and system operating fees below \$50 per point — a marked cost reduction from more conventional solutions.

SmartSynch Delivers Material ROI

As stated previously, the smart metering business case of today means not only having a metering solution that is all around low-cost, but it means having a metering solution that delivers high value and material ROI to the utility technology end-user.

SmartSynch's proprietary operating system (OS), called Transaction Management System (TMS™) seamlessly interoperates with conventional MV90 meter billing solutions. In addition, it expands the ability of the utility to “see” the smart meters in its system and easily access and integrate collected meter data into other utility systems such as customer information systems (CIS), general ledger, outage management (OMS), workflow management (WMS), and SCADA.

ROI for SmartSynch utility customers begins with this extensible information-based functionality — the ability to collect, analyze, and distribute meter and meter billing data across systems. Specifically, smart metering creates the opportunity for utilities to manage power quality and reliability by providing the following additional and enhanced data:

- Voltage and current magnitudes and phase angles, along with time of minimums and maximums;
- Harmonic analysis THD and TIF;
- Event recording triggered by definable set points;
- Data logging; and
- Sequence of event reporting.

To the industry outsider, the above information and enhanced data sets may appear meaningless. However, if one considers that power quality problems are very costly to both energy suppliers and consumers, costing more than \$50 billion in the U.S. last year, the importance of power quality and reliability data monitoring is huge. In fact, capturing and being able to analyze such information will, for the first time in the history of the industry, provide the utility with the opportunity to manage power quality and reliability problems (Table 1).

Perhaps even nearer and dearer to the utility core competency of delivering energy are the improvements in operational efficiency and operational cost reduction that meter data solutions and meter data integration solutions can offer — especially in the context of the utility legacy information environment. Monitoring operational data will also ensure optimal delivery and receipt of electricity. Operational aspects include the following:

- Distribution automation;
- Demand-side load management;
- Energy monitoring and analysis;
- Load shedding/transfer;
- Load profiling/balancing;
- Automatic capacitor bank analysis and control (power factor correction) and line-loss optimization;
- Tampering/theft/outage detection;
- Automatic detection of meter/communication failure and outage notification;
- Integration of water/gas consumption;
- Network management/modeling/analysis; and
- Diagnostic/analysis of distribution network.

Table 1: Common Power Quality and Reliability Problems

Power Quality Problem	Typical Cause
Transients	Lightning, ESD, and load switching
Sags/surges (>100 ms)	Load switching and motor starts
Dropouts/outages(<30 ms)	Load switching, fuse clearance, and arc furnace
Over/under-voltage	System overload, load shedding, and transformer tap changing
Voltage flicker	Tap changing, load switching, and load variations
Harmonic current distortion	Nonlinear loads and variable speed drives
Harmonic voltage distortion	High levels of nonlinear current, variable speed drives, system resonance, and high system impedance
Low power factor	Motor loads and lighting systems
Voltage imbalance	Nonsymmetrical load
Over/under-frequency	System overload

Source: Aberdeen Group, April 2002

Finally, the SmartMeter System powered by SmartSynch can provide additional functionality to the utility enterprise. This additional functionality yields not only operational efficiency and cost reduction, but also business flexibility that adds to the value of the electricity delivery service that utilities provide to customers — the kinds of value additions that inevitably contribute to bolstering the bottom line on the utility balance sheet. These additional functionalities include the following:

- Support for multi-tariff and time-of-use features, allowing for flexible billing schemes;
- Enterprise-wide data capabilities, which give accountants, engineers, operators, and consumers access to real-time information;
- Remote meter configuration, allowing for the correction/verification of ratings and voltages;
- Automatic data integration, data validation, and cost allocation, which increase billing/accounting efficiency;
- Extension of system visibility from the substation to the customer;
- Automatic peak shaving/scheduling/load shedding schemes for the avoidance of demand penalties;
- Automatic power correction for efficient use of distribution/transmission networks;
- Remote connection and disconnection;
- Performance-based rates implementation, where the customer pays a premium rate for a guarantee of minimum power quality;
- Real-time pricing; and
- Apparent power tariffs.

Aberdeen Conclusions

At the end of the day, material ROI and the business case for smart metering solutions are made in dollars and cents. Early SmartSynch SmartMeter System deployments have resulted in cost avoidance, cost savings, and increased revenue for utilities with more than 1 million customers and more than 3,000 commercial and industrial accounts.

While Aberdeen expects that it will be some time before there are universally repeatable and established benchmarks for smart metering ROI, it is clear that the automated metering solution of the past may have been a technology that many utilities thought was a “nice-to-have.” However, in today’s volatile electricity markets where there is ever-increasing margin pressure and where there is an acute need for power quality and reliability, smart metering is an imperative.

The secret for a utility to capture all of the business-, operational-, and revenue-enhancing opportunities offered by smart metering is to deploy. Smart metering is a business case that ultimately makes dollars and sense.

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