The SmartSynch Advantage

2005

4400 Old Canton Road
Suite 300
Jackson, MS 39211

1 Overview

As a preeminent pioneer in integrating automated meter reading with wireless technologies, SmartSynch is uniquely positioned to provide guidance on the requirements necessary to implement the best wireless smart metering solution in the world. SmartSynch Inc. (SSI) is the leading provider of smart metering solutions throughout North America with an installation base of twenty-eight major utilities. Since the introduction of SmartSynch's SmartMeter System (SMS) nearly 5 years ago, the Company has deployed more poly-phase meters with embedded wireless communications than any other company. Furthermore, SmartSynch has accumulated a wealth of smart metering expertise from the following:

1) **Feedback from its extensive installation/customer base**. SmartSynch has deployed smart metering systems to numerous utilities, many which are considered to be progressive leaders in the application of metering technology. *Correspondingly, these utilities have provided SmartSynch with deep subject matter expertise*.

2) **The industry knowledge of its partners such as Elster Electricity LLC, Itron Inc., and Itron Metering (formerly Schlumberger Electricity Metering)**. These partners are leading technology providers and knowledge sources for the global energy industry. Several thousand utilities worldwide rely on their products and services. The combination of its partners' broad knowledge base with SmartSynch's focused technology expertise provides cost-effective solutions for the commercial and industrial (C&I) arena that are efficiently integrated into the overall technology objectives of each utility. *Effective smart metering does not rely solely on intelligent data collection technology, but instead is predicated on utilizing the data wisely throughout the organization.*

3) **Energy industry forecasting by SmartSynch's influential group of investors**. SmartSynch's investors include many of North America's predominant energy industry leaders including those with a unique understanding of and stake in North America's present and future energy needs. *Blending its current deployment successes with its insight into future energy industry trends, SmartSynch affords immediate high-impact solutions that fulfill and sustain long-term utility goals.*

By leveraging its knowledge base, SmartSynch has integrated the following list of success determinant factors into its world leading wireless C&I solution: the SmartMeter System. These guidelines constitute a roadmap by which each utility can more effectively promote more efficient collection of their C&I data while satisfying and exceeding their immediate metering demands.

2 C&I Smart Metering Essentials

2.1 Institutional Certification of Quality

In order to easily verify and benchmark the quality of the solution, all SmartSynch SmartMeters are certified by a variety of leading industry standard testing organizations. Where applicable, these include certifications from Industry Canada (IC), the Federal Communications Commission (FCC), and the American National Standards Institute (ANSI). These organizations spend significant resources ensuring that the quality (or lack thereof) of a product does not negatively affect the well being of the consumer or the economic prosperity of the utility.

2.2 Minimization of Installation & Operational Costs

Installation and operational costs drive successful return on investment in smart metering. By embracing the following requirements, SmartSynch has been able to provide a considerable reduction in the overall cost of implementation and operation, which correspondingly increases the rate of return.

2.2.1 Under The Cover Solution

All components of the SmartSynch SmartMeter solution are placed “under glass” as part of the existing meter housing unit. This solution provides the most cost-effective and expedited deployment by eliminating the additional expense and time related to external housing unit and wiring installation.

2.2.2 Communication via Publicly Available Network

The SmartSynch SmartMeter solution utilizes a publicly available network for commercial use. In the C&I market, consumers are typically dispersed over a wide geographic area such that the build-out of a private network is less feasible and more capital intensive. By contrast, public network solutions support more cost-effective automation of C&I meters by employing existing infrastructures with broad geographic coverage. Furthermore, utilities may devise a more flexible deployment plan based on strategic objectives rather than being constrained by build-out location. Finally, the operation and maintenance of the public network is provided by some of the largest telecommunications companies in the world whose revenue and corporate success is based on ensuring the reliability, security and performance of the network.

2.2.3 Wireless Communications

The SmartSynch SmartMeter solution utilizes a wireless network. Antiquated Automated Meter Reading (AMR) systems utilizing phone modems incur economically stifling communication costs. Wireless network costs are much more affordable than the legacy phone-modem alternatives. Significant recurring operational cost savings can be garnered by wireless network implementations. Additionally, wireless solutions provide greater reliability than phone modem solutions that have a high rate of call failure and dropped connections.

2.2.4 Remote Configuration and Service via TMS

The SmartSynch SmartMeter solution provides a mechanism for modifying configuration and scheduled events remotely via a head-end software platform (i.e. TMS). This functional flexibility minimizes costly return visits to the meter for configuration and servicing issues by enabling adjustments to be initiated and completed immediately from within the business operation facilities.

2.2.5 Perpetually Rechargeable Back-Up Power Source

The SmartSynch SmartMeter solution incorporates a rechargeable back-up power source that never needs to be replaced. This power source allows for

controlled power outage operations and eliminates the need for non-rechargeable batteries that must frequently be replaced by costly return visits to the meter.

2.2.6 Coverage Validation

Deployment of the SmartSynch SmartMeter solution is supported with tools that assist in verification of coverage either prior to or during installation. These tools validate the communication quality of an installation site and identify meter sites that will require an external antenna for high-grade communication to the head-end software.

2.3 Heterogeneous Data Acquisition

Flexible data capture is the key to building economically effective consumer rate plans. The smart meter solution must be diverse enough to capture different types of data for different classes of consumers so that rate incentives can be tailored for maximum consumer and utility benefit.

2.3.1 Time of Use

The SmartSynch SmartMeter solution supports Time of Use (TOU) functionality where consumption can be aggregated into rate "bins" based on the time of usage. This allows utilities to provide varying price alternatives to consumers based on multiple peak and off-peak rate structures thus providing direct incentive to conserve during periods when the highest energy usage is anticipated.

2.3.2 Critical Peak Pricing

The SmartSynch SmartMeter solution supports Critical Peak Pricing (CPP) functionality that enables utilities to designate specific "super-peak" periods of time dynamically as energy prices warrant. During Critical Peak periods, consumption is aggregated into a special rate bucket that supersedes existing TOU rate structures. By offering CPP rate plans, utilities can provide dynamic conservation incentives to consumers based on energy market fluctuations.

2.3.3 Interval Metering

The SmartSynch SmartMeter solution supports Interval Metering. Measurement of electricity usage within pre-defined interval periods enables the utility to provide fine-grained feedback of energy usage to the largest consumers on a daily or even near-real time basis. Furthermore, Interval Metering affords the greatest flexibility to implement future rate structures.

2.3.4 5-minute Intervals

The SmartSynch SmartMeter solution supports intervals as small as 5 minutes. Although the majority of meters will not utilize 5-minute intervals, this level of granularity enables the largest consumers to implement load research applications and to make near-real time consumption decisions.

2.3.5 Pulse (KYZ) Output

The SmartSynch SmartMeter solution supports Pulse (KYZ) output. This enables larger consumers to monitor usage via an in-house energy management system.

2.3.6 Scheduled Data Acquisition

The SmartSynch SmartMeter solution allows for the configuration of future scheduled data reads, events and tasks. This feature provides the most efficient way to automate repetitive tasks and reduce daily user interaction thus freeing resources to focus on more urgent priorities.

2.3.7 On-Demand Data Acquisition

The SmartSynch SmartMeter solution supports on-demand reads and ad-hoc requests for data from the meter. This feature provides data in a timely fashion and allows the utilities to dynamically react to evolving issues and needs.

2.3.8 Automatic Data Recovery

The SmartSynch SmartMeter solution supports the automatic recovery of missing data. The system is capable of automatically re-requesting reads which have not been returned as scheduled. This ensures the completeness of data and avoids time-consuming manual intervention by the utility's resources.

2.3.9 Aged Data Retrieval

The SmartSynch SmartMeter solution supports the retrieval of aged data still present on the meter in the event of missed reads. This mitigates the risk of missed reads or incomplete data acquisition.

2.3.10 Configurable Storage Capacity

The SmartSynch SmartMeter solution supports a configurable storage capacity so that the amount of historical data stored within the meter may be adjusted to the requirements dictated by any utility oversight regulations.

2.3.11 Automatic Clock Synchronization

The SmartSynch SmartMeter solution can automatically synchronize the meter clock with a reference/atomic clock. Over time, most meter clocks deviate to some degree. Automatic Clock correction/synchronization guarantees the most accurate representation of usage over time.

2.4 High Impact Reporting

Data accessibility provides consumers with the tangible feedback that drives demand response and utilities with the consumption data necessary to derive the best customer sales and support strategies. The marriage of high data availability with tailored service plans promotes a healthy and sustainable energy market characterized by incentive based consumer conservation and positive utility economics.

2.4.1 Real-Time Interval Reporting

The SmartSynch SmartMeter solution supports real-time reporting whereby interval data is returned as frequently as the end of each interval. Real Time Interval Reporting enables utilities to offer effective load curtailment programs through which consumers are motivated to modify their consumption as a result of fast access to their usage data during the curtailment event.

2.4.2 Configurable Alarm Reporting

The SmartSynch SmartMeter solution has the ability transmit various alarms autonomously as certain configurable thresholds are reached. Furthermore, the utilities have the ability to configure the types of alarms about which they are most concerned. A sampling of the alarm events that are supported include:

- Power Outage or Restoration Alarms
- Demand Threshold Alarms
- Reverse Rotation and Tampering Alarms
- Meter Time/Clock Error alarms

2.5 Secure and Responsive Communications

In the SmartSynch SmartMeter solution, communications between the meter and the head-end software are secure, bi-directional and fast. SmartSynch has spent tremendous effort to ensure the security and responsiveness of the bi-directional communication component of the application because security uncertainties and performance impediments within the communication layer risk the efficacy of the entire solution. Furthermore, reliable two-way communication allows utilities to proactively retrieve data based on changing daily dynamics.

2.5.1 Secure Communications

The SmartSynch SmartMeter solution utilizes end-to-end encrypted communication between the meter and TMS. Encryption reduces the risks of data theft and security breaches.

2.5.2 Two-Way Communications

The SmartSynch SmartMeter solution utilizes two-way communication between the meter and TMS. Two-way communication permits the utility to enact on-demand reads, schedule changes and monitoring modifications after installation.

2.5.3 Real-Time Response

The SmartSynch SmartMeter solution provides real-time response. Near immediate response is a necessity for ad-hoc requests where access to immediate information is paramount.

2.5.4 External Antenna

The SmartSynch SmartMeter solution provides for an optional external antenna (no gain or high-gain) that includes an isolation circuit for safety. The external antenna ensures high quality communication between the meter and TMS when meters are located underground or in enclosed cabinets.

2.6 Transaction Management System (TMS) Software Features

The SmartSynch Transaction Management System (TMS) is the catalyst for improved operational efficiency. TMS is scalable, standardized, flexible, easy to use and requires minimal resource overhead during installation and operation. Furthermore, TMS allows existing utility resources to maximize their productivity within the framework of the existing information technology environment.

2.6.1 Multiple Meter Manufacturer Support

TMS supports meters from multiple manufacturers. This provides utilities the ability to select from a variety of solutions as needs or pricing dictate and eliminates the risk of locking into to a single manufacturer.

2.6.2 Multiple Network Support

TMS supports multiple network types and multiple network carriers. This provides utilities the ability to achieve maximum communication coverage and to select from a variety of data plan options that best fit their needs.

2.6.3 Standards Based Software

TMS is based on industry standard open architectures (J2EE etc.) and relational databases (SQL Server, Oracle etc.) so that it most effectively fits into the existing Information Technology infrastructures of utilities.

2.6.4 Scalable Platform

TMS provides maximum scalability. As TMS is a long-term business driver for utilities, tremendous amounts or research and development have been expended

to afford TMS the capability of supporting the largest C&I meter populations.

2.6.5 Minimal Desktop Support

TMS requires minimal desktop support during implementation of the metering solution. TMS utilizes a browser-based interface providing the most universal solution with the least support requirements. Reduction of desktop support allows utilities to focus their Information Technology resources on server configuration and support.

2.6.6 Production and Meter Shop Environments

TMS supports utilization in both the production and meter shop environments. This allows for testing of the meters prior to deployment in the field.

2.6.7 Message, Alert and Alarm Routing

TMS provides a message routing facility that can send messages, alerts and alarms to one or multiple resources via standard e-mail.

2.6.8 Logical Grouping of Meters

TMS provides logical grouping of meters. Meter grouping facilitates support for billing cycle reporting and exporting. Furthermore, execution of tasks at the group level provides the most efficient mechanism for configuring large numbers of meters with minimal user interaction.

TMS supports the establishment of schedules at the group level that are automatically programmed into all meters added to the group. In addition to scheduling at the group level, on-demand requests or configuration changes are available at the group or individual meter level to provide the greatest data acquisition and configuration flexibility.

2.6.9 Troubleshooting Tools

TMS provide tools for identifying meters that are not reporting as required. These tools aid in determining whether reporting issues are configuration, meter, communication module or network related.

2.6.10 Event, Task and Response Monitoring

TMS enables all field and application events to be monitored and viewed within the system. This provides utility resources with the most accurate view of the current state of system requests and responses.

2.6.11 Seamless Export Interface

TMS seamlessly exports data to external systems using industry standard formats such as the Itron Hand-held Reader File Format (HHF), Itron Mainframe MV90 format, or the California Metering Exchange Protocol (CMEP). These export interfaces provide a simple mechanism for transferring billing and interval data from TMS to other systems utilized for outage management, load analysis, web presentment and consumer billing.

2.6.12 Data Archival and Restoration

TMS provides archival of data for which online access is no longer required as well as restoration of archived data for on-line use. Archival functionality reduces database load and maintains optimum system performance. Furthermore, the ability to restore archived data provides utilities a mechanism for retrieving historical data as requested by customers or required to settle billing disputes.

3 Summary

In the aftermath of incidents involving rolling blackouts and power grid failures, the Energy Industry is at a crossroads where prudent technology choices will foster the long-term welfare of the energy market. Utilities and consumers need not greet these choices with skepticism or trepidation. Reliable and proven smart metering technologies capable of facilitating conservation and increasing efficiencies do exist. By embracing SmartSynch technologies, utilities will be able to provide tangible consumer incentives that empower consumers to reap the benefits of their conservation efforts while simultaneously ensuring long-term economic profitability.

Ultimately, only the unification of these consumer and utility ambitions can provide the market mechanics necessary to achieve sustained energy efficiency in North America. Thus the guidelines contained herein strive to afford utilities the ability and consumers the motive to effect positive change. Simply stated, this is the SmartSynch advantage.