Blake, Cassels & Graydon LLP June 2008

Blakes Bulletin
Information Technology

AMI System Procurement – Aligning Vendor Interests

MATTHEW FLYNN

INTRODUCTION

Advanced Metering Infrastructure (AMI, as defined below) is gaining ground in North America and beyond as not only a market-driven, but increasingly a government-mandated technology implementation aimed at modernizing and improving the public utilities infrastructure. And for good reason. The expected benefits of implementing an AMI system are great, and have been widely acknowledged to span the spectrum from economic advantage for consumers and retailers, to progressive and responsible government energy policy.

While the various market incentives and government mandates spurring utilities to implement AMI systems have translated into a robust market, the cost of procuring and implementing the requisite technologies is high. The U.S.-based Electric Power Research Institute (the EPRI) puts the cost at US$201 to $250 per installed meter. The capital outlay of Southern California Edison Company to implement its AMI system has been stated in the online publication *Transmission & Distribution World* (January 1, 2007) as approximately US$1.3-billion in capital funds, while the Brattle Group discussion paper *The Power of Five Percent: How Dynamic Pricing Can Save $35 Billion in Electricity Costs* (May 16, 2007) estimates that full AMI deployment across the U.S. would cost about US$26-billion.

The risks also run high. Implementing an AMI system is a technically and logistically challenging proposition, and getting it wrong will impact many stakeholders. In the paper *Demand Response and Advanced Metering Infrastructure in California: A Problem, A Solution, and a Program*, the authors contend that the failure of advanced metering could undermine public confidence and public security, and could cost the State, its utilities, ratepayers, and taxpayers alike, significant time, money, and opportunities.

Clearly, the implementation of an AMI system is an expensive and risky proposition. And the risks can be exacerbated if a utility, whether by necessity or by choice, procures the various components of an AMI system from different vendors. In such a situation, a key risk mitigation strategy will be for the utility to align the interests of such vendors towards producing and maintaining a successfully implemented and fully functioning solution. This bulletin suggests some ways in which such an alignment of vendor interests might be achieved.

THE ADVANCE OF AMI

The market drivers behind AMI are compelling. The EPRI, in its online report of February 2007 entitled *Advanced Metering Infrastructure* (AMI) (at www.EPRI.com) cites three broad categories of advantages stemming from AMI implementation:

(1) system operation benefits including reduction in meter reads and associated management and administrative support, increased meter reading accuracy, improved utility asset management, easier energy theft detection, and easier outage management;

(2) customer service benefits including early detection of meter failures, billing accuracy improvements, faster service restoration, flexible billing cycles, providing a variety of time-based rate options to customers, and creating customer energy profiles for targeting Energy Efficiency/Demand Response programs; and

(3) financial benefits including reduced equipment and equipment maintenance costs, reduced support expenses, faster restoration and shorter outages, and improvements in inventory management. Numerous consumer, utility and social benefits are also cited in the February 2008 report *Advanced Metering Infrastructure* prepared by the National Energy Technology Laboratory for the U.S. Department of Energy Office of Electricity Delivery and Energy Reliability.

CONT'D ON PAGE 2

CONT'D FROM PAGE 1

Market impetus aside, governments in North America have also embraced AMI in the name of responsible energy policy. In Canada, the Ontario provincial government has committed to install AMI meters (generally referred to as "smart" meters) in 800,000 homes and small businesses by the end of 2007 and throughout Ontario by 2010, and British Columbia has recently passed legislation mandating the province-wide deployment of smart meters by 2012.

The United States, for its part, has legislated the "smart metering" standard of the *Energy Policy Act of 2005* (Section 1252) under which States are required to consider whether to implement time-based metering and communications. In December 2007, the *Energy Independence and Security Act of 2007* became law. The National Energy Technology Laboratory expects this legislation to serve as a major catalyst for rapid deployment of AMI and grid modernization. New York, Texas, Connecticut and California have all initiated pilot programs incorporating demand response and advanced metering.

Utilities have responded. In its 2007 AMR Report (12th Edition), the independent information services company Chartwell stated that the percentage of utilities planning installations of advanced metering systems doubled in 2007, and 18 per cent of utilities were then in the final planning stages of moving toward AMI. Hydro One (Ontario) has begun installation of smart meters in southern Ontario and expects to complete the installation of 1.3 million throughout its service territory by 2010. British Columbia's rollout of AMI will include 1.7 million existing homes and businesses, and AMI has been implemented to varying degrees by Hydro Ottawa, Manitoba Hydro, and Toronto Hydro-Electric. Enmax Power in Alberta has identified AMI as a primary focus. In California, Pacific Gas and Electric contracted for an advanced metering infrastructure for over nine million gas and electric meters in 2006. The same year, utilities such as San Diego Gas and Electric, Portland General Electric, Florida Power and Light, and Centerpoint Energy Company issued RFPs for advanced metering.

In December 2006, Southern California Edison Company (SCE) also issued an RFP to deploy an AMI system with over five million meters to cover its entire service territory, and executed the associated contracts throughout the latter half of 2007. Internationally, there are many AMI installations including in Italy, Sweden, Netherlands, Austria, Norway, Australia, the U.K., and others.

MULTI-COMPONENT NATURE OF AN AMI SYSTEM

Although there appears to be no single best AMI system design, and different utilities will choose different AMI system components and designs depending upon the utility's technical starting point, geography, regulatory situation and long-term vision, the general consensus among utilities, AMI vendors and regulators appears to be that an AMI system is made up of three major components:

- smart meters,
- a communications network, and
- a data management system.

The EPRI has described AMI as typically referring to the full measurement and collection system that includes meters at the customer site, communication networks between the customer and a service provider, such as an electric, gas, or water utility, and data reception and management systems that make the information available to the service provider.

Even assuming only three major components, a utility still has many choices with respect to the specific types of components that will make up its AMI system. For example, a smart meter may be a retrofitted electromechanical or solid state meter, or a new solid state meter designed to accommodate communication modules; and an AMI communications network may make use of broadband over power line, power line communications, fixed radio frequency (RF) systems, or systems using public networks such as telephony (cellular or landline), or satellite.

CONT'D ON PAGE 3

CONT'D FROM PAGE 2

For purposes of analysis, this article uses the triple-component definition of an AMI system as stated by EPRI, and assumes the use of a fixed, private RF communication network over which the smart meters transmit information to an AMI host system/database (which is part of the communications network and functions as a master data concentrator) using repeaters and data collectors. The AMI host system/database, in turn, communicates the information to a management system (often referred to as a meter data management system, or an MDMS). This article further assumes that a meter manufacturer provides the meters, a communications provider provides the communications network, communications modules and AMI host system/database, and a third vendor provides the MDMS.

MULTIPLE COMPONENTS: MULTIPLE POINTS OF FAILURE

The multi-component nature of an AMI system means that there are multiple potential points of failure throughout the system. Consider that if an MDMS stops receiving information from a smart meter, the cause of failure could be the meter itself, the communications module inside the meter, the communications network (including the repeaters/data collectors or the AMI host system/database), or the MDMS.

Further, in the case of an AMI system consisting of multiple vendor products, a problem could arise not only at the component level, but also as the result of faulty communications interfaces *between* such products.

If an AMI system stops functioning, it would cripple a utility's ability to read meters and generate invoices, as well as impact the myriad of other AMI features that utilities might benefit from, such as load control and outage management. Given the criticality of a properly functioning AMI system to its business operations, the last thing a utility needs in the event of an AMI system failure is to have various system component vendors pointing blame at each other, rather than working in concert to get the system back up and functioning properly.

THE MULTI-VENDOR ISSUE

For a utility, buying an AMI system consisting of components from multiple vendors will exacerbate the already considerable risks involved in its AMI implementation, as described above.

As pointed out in the September 2006 Plexus Research, Inc. report prepared for the Edison Electric Institute, *Deciding on "Smart" Meters: The Technology Implications of Section 1252 of the Energy Policy Act Of 2005*, many of the bigger AMI vendors will actively solicit "turn-key" projects – that is, where all responsibilities, the system components, installation, integration, commissioning, acceptance testing, and initial operation are placed on a single contractor. Although this will result in the procuring utility having only one contract for its AMI system and thus only one vendor "throat to choke", it will not entirely mitigate the utility's risks because the resulting solution will still likely involve components from multiple vendors. In addition, the relatively higher costs and risks to a turn-key system vendor will be reflected in higher costs passed on to the utility.

Conversely, many vendors are adverse to signing up for turn-key projects, thereby forcing the utility to enter into multiple contracts to procure its AMI system. Vendor contracting practices and higher pricing aside, some utilities will be forced to contract with multiple vendors because their particular AMI system needs will require mixed-technology systems due to such factors as widely varying environments (e.g., dense foliage), customer densities, terrain issues, and needed capabilities.

STRATEGIES TO ALIGN VENDOR INTERESTS

I. Strategy in the Turn-Key Contract Context

One strategy a utility can employ to foster the alignment of individual vendors towards producing and maintaining a successfully implemented and fully functioning AMI system, albeit not unique to this situation, is to pursue a turn-key solution – that is, to require from the outset (e.g., the utility's RFP for an AMI system) that one vendor take on all obligations, responsibilities and liabilities for the delivery of the AMI system.

CONT'D ON PAGE 4

CONT'D FROM PAGE 3

Under this contract structure, the utility enters into a single contract (the Prime Contract) with one ultimately responsible "Prime Contractor", and the rest of the vendors involved in producing the AMI system are subcontractors to the Prime Contractor. The intended benefit to the utility of this contract structure is to give the utility a single point of contact and accountability. If one vendor fails to provide a properly functioning, integrated and interfacing component and such failure results in a non-functioning AMI system, then the Prime Contractor is not delivering under the Prime Contract with the utility and must address and correct the problem.

It should be noted that this Prime Contractor strategy depends heavily on the ability of the Prime Contractor to quickly bring its faltering subcontractor(s) into line, and force them to rectify the problem. Accordingly, in employing this strategy, a utility will want to ensure that the subcontracts between the Prime Contractor and the subcontractors include adequate provisions that give the Prime Contractor the necessary clout to spur its subcontractors to action.

A common, but not failsafe, practice in this regard is to require that the Prime Contractor 'flow down' certain key provisions from the Prime Contract into the related subcontracts. Such provisions might include representations and warranties, covenants, indemnities, damages, and service levels and related liquidated damages in the form of service level credits. Even so, a Prime Contract structure will limit the visibility of the utility into each subcontractor's performance and will not give the utility the comfort of having a direct contract with, and direct control over, the various AMI system vendors that act in the capacity of subcontractors.

In addition, the current nature of the AMI marketplace may weaken the case for pursuing a Prime Contract strategy. For example, although a communications network vendor arguably supplies the most complicated and crucial component of an AMI system, it is likely that such vendors (many of them small, nascent companies) will have less financial wherewithal and less experience with large scale utility implementations than would their established meter vendor counterparts.

Accordingly, not only may a communications vendor as a Prime Contractor not have the knowledge and experience to appropriately manage its subcontractors and satisfy the utility in the context of a large and complex AMI rollout, but its finances may be inadequate to cover the potentially huge liabilities that a failed AMI rollout would entail. The utility may want to avoid concentrating project risks into a single lead vendor, and may prefer to contract directly with each vendor in order to diversify some of the utility's risks and give it access to additional assets in the event of a project default.

Lastly, as noted above, a Prime Contract may involve relatively higher costs passed on to the utility by the Prime Contractor as compared with a multiple contract situation.

II. Strategies for the Multiple Contract Context

Given the possible shortcomings of a turn-key Prime Contract strategy, a utility may be more inclined to pursue a separate contract with each vendor providing components of the AMI system. In such a multi-contractual context, a utility can utilize several strategies to focus individual vendors on the goal of a successfully implemented and fully functioning AMI system. In order to achieve the maximum advantage of these strategies, a utility should try to draft the various contracts with each of the vendors in an integrated and, if possible, concurrent manner.

A compelling strategy to align vendor interests in this circumstance is to include, in each vendor contract, a provision that holds back a portion of the payments otherwise due to a vendor for its individual contribution to the AMI system until such system, as an integrated whole, is working end-to-end in accordance with the stated functional and technical specifications. For example, the contract with a meter vendor would provide that, upon the utility's acceptance of the meters as functioning properly, the meter vendor will receive a portion of the total amount payable for such meters. Under such contract, the balance of the amount payable by the utility is not paid to the meter vendor until achievement of the successful transmission of meter data by the accepted meters, once installed, to the AMI host system/database or, further, to the meter data management system.

CONT'D ON PAGE 5

CONT'D FROM PAGE 4

Likewise, the related contract with the communications network vendor would provide that, upon the acceptance of the communications network by the utility as functioning properly, the communications vendor will receive a portion of the total amount payable for the network. Again, under such contract, the balance of the amount payable by the utility is not paid to the communications vendor until achievement of the successful transmission of meter data from the meters, over the communications network to the AMI host system/database or beyond to the meter data management system. A similar holdback would be used in the utility's contract with the provider of the meter data management system. In employing this strategy, a utility should be careful to set the amount of the holdbacks at a reasonable level so as to avoid putting any vendor in financial jeopardy should the AMI system take longer to implement than expected. The holdback strategy is meant only to defer vendor profits in order to provide a group incentive to implement the complete system.

Another strategy that may be used by a utility is the imposition of joint service levels on all of the vendors involved in producing the AMI system. Each contract with the meter vendor, the communications vendor and the meter data management vendor would include provisions by which all vendors would be jointly accountable if the AMI system fails to meet certain service levels designed to treat non-performance by any vendor as non-performance by all. These joint service levels would be used when the utility believes that it may be difficult and costly to attempt to allocate fault among the vendors. For example, when data from a meter is not received at the AMI host system/database, or is received with distortions, loss of metadata or other problems that impact the usability of the data, then both the applicable meter vendor and the communications vendor would be viewed as failing to meet a joint service level for the reliable transmission of data.

Similarly, if command data is sent from the AMI host system/database to a meter and the data is not shown as received by the meter, then the applicable meter vendor and the communication vendor would both be considered as failing to meet a joint service level for the reliable transmission of command data. By use of these joint accountability service levels, a meter vendor will not be able to avoid accountability for data transmission problems by asserting the communications vendor failed to perform and the communications vendor likewise will not be able to avoid accountability for a data transmission problem by identifying the problem as originating with the meter vendor. Their joint accountability will help force the vendors to work together within the governance structures and requirements described in the last section of this article.

Finally, provisions that require co-operation amongst individual vendors can be used to establish and cultivate an open and functional multi-vendor environment. In general, such a provision would include an acknowledgement by each vendor in their separate contract with the utility that multiple third-party vendors will be involved in providing the services and equipment that constitute the AMI system, as well as the express agreement of each vendor to co-operate with the utility and all third-party vendors in order to allow such third-party vendors to provide the requisite services and equipment in an integrated, seamless and timely manner, without disruption to the utility's business operations. Specific examples of provisions promoting co-operation among all vendors include requiring each vendor to:

- provide reasonable access to the facilities used by the vendor to provide its services or equipment as necessary for a third-party vendor to perform its work;
- provide reasonable access to the technical environment and the equipment, software, tools and methodologies being used by the vendor to provide its services or equipment to the extent necessary for a third-party vendor to perform its work, including the integration of such equipment, software and tools with those of a third-party vendor;
- work with third-party vendors to ensure that all components of the AMI system are fully compatible with each other;
- provide third-party vendors such information and data regarding the services, equipment, software, tools, methodologies and vendor's operating environment, processes and other operating parameters as a third-party vendor with reasonable commercial skills and expertise would find reasonably necessary to perform its work; and

CONT'D ON PAGE 6

CONT'D FROM PAGE 5

- co-operate with third-party vendors (including by providing any performance information or data obtained by vendor in the conduct of its own root cause analysis of AMI system problems) in performing root cause analysis of problems with the services or equipment, whether the ultimate responsibility for performing such root cause analysis lies with the vendor or with any such third-party vendors.

Because the foregoing provisions promote the exchange of information among vendors and an open, multi-vendor environment that gives each vendor a degree of transparency into what the other vendors are doing, a complementary provision would be a positive obligation upon each vendor to promptly notify the utility if the actions or omissions of a third-party vendor is likely to cause a problem or delay with respect to the provision of the services or equipment by the vendor, and to work with the utility and the third-party vendors to prevent or circumvent such problem or delay.

CONCLUSION: MAKING IT ALL WORK

Whether a utility decides to pursue a single Prime Contract or multiple contract structure in connection with implementing an AMI system made up of components from several vendors, a key to making the multi-vendor endeavor work will be robust governance and management by the utility, and the creation of an all-parties forum in which the utility and the vendors are active and empowered participants. Accordingly, the subject contract(s) should include provisions that set up, at a minimum, an executive or steering committee made up of representatives from the utility and each of the vendors. This committee would be tasked with, for example, advising in respect of the utility's strategic and tactical decisions regarding the establishment, budgeting and implementation of the utility's priorities and plans for the AMI system implementation, and with monitoring and resolving disagreements regarding the provision of services, equipment and the overall implementation.

Given the complexities involved, the establishment of additional governance bodies (such as a multi-party project management office) may be in order. As well, provisions that establish and identify responsible individuals and offices, that mandate specific reporting and meeting requirements, that allow the utility to call for *ad hoc* reports and meetings, and that set forth mandatory and empowering problem escalation and dispute resolution procedures, should be used to help build a communicative, transparent, responsive and responsible utility-vendor environment that is focused on the success of the overall endeavor: implementing and maintaining a functioning and beneficial AMI system.