FINAL REPORT

OF THE

COMPETITIVE METERING WORKING GROUP

TO THE

PUBLIC SERVICE COMMISSION OF MARYLAND

MAY 2001

David L. Moore
Thomas E. Dewberry
Mediators

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MEDIATORS' OBSERVATIONS

This document is the Report of the Commission's Competitive Metering Roundtable Working Group ("Working Group"). This Report reflects the considerable efforts of the Working Group participants,[1] who have met regularly since its first meeting on September 22, 2000.[2]

The deliberations of the Working Group endeavored to examine and evaluate the prospects for implementing competitive metering. The efforts of the participants have resulted in producing a Report that presents the Commission with two differing approaches to accomplishing the implementation of competitive metering. Certain other positions were discussed in the Working Group but every party did not present a formal position to be included in the final report. The first part of the Report reflects an approach to competitive metering, elements of which were discussed during Working Group sessions, while the second part reflects the position of the Staff and the utility companies for competitive metering in Maryland.[3] Although both parts of the Report use a "phase-in" approach for implementing competitive metering, the nature of the "phase-in" depends upon consideration of the definition of "competitive metering." The Phased Alternative One approach assumes a definition of competitive metering that requires full unbundling of all competitive metering functions in a specific time period. The Phased Alternative Two approach, on the other hand, does not require full unbundling and implements competitive metering by phasing in metering service functions over an extended period of time. Each group asserts that its approach is consistent with the statutory requirement for implementing competitive metering.

The participants engaged in extensive discussions regarding the respective approaches but were unable to arrive at a consensus position for recommendation to the Commission. Thus, this Report presents the Commission with a choice of alternative approaches for implementing competitive metering. Once the determination is made, the participants indicate that the full Working Group should then go forward based on the Commission's selection of an approach.

The Mediators commend the hard work that all the participants have made to this process. We believe that the diligence of the Working Group's effort will be useful to the Commission.

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[1] The following organizations were participants in the Competitive Metering Roundtable Working Group: Allegheny Energy, Inc., Allegheny Power, Baltimore Gas and Electric Company, BGE Home, Choptank Electric Cooperative, Inc., Conectiv, First Energy Services, IMSERV, Itron, Inc., the Office of People's Counsel, the Staff of the Public Service Commission, Mid-Atlantic Power Supply Association, National Energy Marketers, Olameter, Potomac Electric Power Company, Southern Maryland Electric Cooperative, Inc., Washington Gas Light Company, and Schlumberger, Inc.

[2] In Order No. 74561, dated September 10, 1998, the Commission directed an initial meeting be held regarding Competitive Metering on September 4, 2000. At the request of the Commission Staff, the meeting was postponed, rescheduled and held on September 22, 2000. Subsequent to that meeting, the Working Group held a series of daylong meetings over several months culminating in the production of this Report.

[3] The Office of People's Counsel (OPC) agrees with the overall conclusions and recommendations set forth in the Staff and companies' proposal. In doing so, OPC reserves all rights to present its positions at each phase of these proceedings regarding any further implementation of competitive metering and cost recovery issues related thereto.

PART ONE

PHASED ALTERNATIVE ONE

The Maryland Electric Customer Choice and Competition Act of 1999 (hereinafter "Act) sets forth certain legislative policies designed to facilitate the implementation of electric customer choice. Certain provisions of the Act relate directly to the creation of competitive metering. In particular, Md. Code Ann., Pub. Util. Cos. Article § 7-511(a)(2)(3)&(b) (1999 and Supp. 2000), states the following:

> a) Except for electric cooperatives and municipal electric utilities:
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> (2) competitive metering for large customers shall begin on January 1, 2002; and
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> (3) competitive metering for all other customers shall begin on April 1, 2002, or earlier if requested by the electric company.
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> (b) The Commission shall adopt regulations or issue orders to implement this section.

Further, three of the four investor owned utilities (hereinafter "IOUs"), have included competitive metering provisions within their respective restructuring settlements. The paragraphs below reflect the various competitive metering provisions contained in the restructuring settlements agreed to by BGE, Allegheny and Conectiv. The settlement agreement entered into by Pepco does not contain any provisions addressing competitive metering.

> Paragraph 45 of the BGE Settlement:
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> Notwithstanding any other provision of this Paragraph, competitive metering shall commence on January 1, 2002 for customers with hourly demand meters greater than 1500 kW and on April 1, 2002 for all other customers, consistent with Code Section 7-511. BGE shall file with the Commission to unbundle its rates for metering services sufficiently in advance to permit implementation of competitive metering services on January 1, 2002. The term "net competitive metering related transition costs" when used in this Settlement means any prudently incurred, verifiable and non-mitigable net competitive metering related transition costs, which, as set forth in Paragraph 2, are not included in the transition cost recovery amount. BGE may petition the Commission to recover its net competitive metering related transition costs, if any. The Settling Parties agree that prior to such dates, the Commission should establish the level of net competitive metering related transition costs, if any, and the method of recovery of any such transition costs. The Settling Parties further agree that the Commission should establish and adjust rates to permit recovery of the level of net metering related transition costs and the method for recovery of such transition costs in a separate proceeding that should be completed no later than October 1, 2001. The Settling Parties reserve all rights to protest or take any position on any such filing. Until April 1, 2002, all non-residential customers

with an annual maximum demand of 500 kW or more shall have the right to have advanced metering installed at their facility. The third party supplier or the customer will pay for any such meter and any associated telecommunication expense. The customer shall own any such meter unless the supplier and customer agree otherwise. BGE will install any such meter at no cost on a one-time basis. BGE shall maintain the meter per COMAR. BGE shall have access to billing data on a timely basis and shall provide access to such billing data on a timely basis to customers (or their designated supplier with prior customer approval.)

Paragraph 30 of the Allegheny Settlement:

30. Subject to operating constraints, competitive metering for commercial and industrial customers over 300 kW shall be available as of January 1, 2001 and for all other customers as of April 1, 2002 in accordance with the terms of the Restructuring Legislation. The unbundled rates for competitive metering will be set forth on Attachment No. 4.

Section F. of the Conectiv Settlement:

As of July 1, 2000, 100% of Delmarva's Maryland retail customers with peak loads in excess of 300 kW shall have the opportunity to have meters installed and read by a supplier other than Delmarva. All other customers shall have this same opportunity as of April 1, 2002, consistent with Code Section 7-511 as added by the Act. The Settling Parties agree that prior to such dates the Commission shall establish the level of stranded costs, if any, associated with a customer who chooses a supplier other than Delmarva to install and/or read the customer's meter and the method of recovery of any such stranded costs. The Settling Parties further agree that the Commission should establish and adjust rates to permit recovery of the level of meter-related stranded costs and the method for recovery of such stranded costs in a separate proceeding that should be completed no later than April 1, 2000.

In accordance with the Act, the competitive market for metering is to be opened in 2002, specifically January 1st for commercial and industrial customers and April 1st for residential customers. Suppliers assert that all metering services and functions should be made competitive on or before January 1, 2002 for commercial and industrial customers and April 1, 2002 for residential customers to comply with the Act and settlements. However, in an effort to compromise, some suppliers have proposed the following phased in approach. Recognizing the importance of having ample time to address the myriad of policy and technical issues involved in CM, these parties suggest that a clearly defined phase in process is a reasonable compromise toward achieving this legal and regulatory mandate. This approach would allow the Commission to continue the roundtable-working group proceedings so that parties could make policy and technical recommendations and gather information that may assist the Commission in the decision making process during implementation of CM.

Parties participating in the CMRT have been unable to reach agreement as to the meaning of "competitive metering" or how it should be implemented. Some parties believe that a competitive metering market means that entities other than the distribution companies will be responsible for providing metering services and functions. Other parties assert that competitive metering can be achieved

by allowing the distribution companies to continue providing all metering services and functions and simply sending the utility collected data to metering suppliers. The term "metering suppliers" should not be used under the second scenario as suppliers will not be supplying any metering related services or functions, they will merely be receiving customer data from the utilities.

If CM is to occur, it must first be defined, and a logical timeframe or progression needs to be set in place for when CM will be fully implemented. As discussed above, these parties assert that CM means creating a legal and regulatory environment where entities other than the regulated Electric Company have the responsibility of providing all metering services and functions. These services include but are not limited to: ownership, installation, servicing of equipment, maintenance, testing, reading, data management, validation, editing, estimations, billing. Competitive metering can be achieved through a specifically designed phase in process, such as the process described below.

Nothing in this proposal is intended to preclude parties from exercising their right to petition the Commission if such party believes that the provision of certain metering services should be restricted to provision by the Electric Company only. The petitioning party, however, should bear the burden of showing adequate cause as to why a service or function should not be competitive. Further, prior to the filing of any petition, parties should be required to initially attempt to address and resolve contentious issues with other parties in the roundtable-working group meetings.

I. PHASE ONE

Phase One requires the utilities to make metered data for all customer classes, available to suppliers and third parties (subject to customer consent) immediately upon the issuance of a Commission Order. Also during Phase One and simultaneously with the issuance of an Order, the CMRT would reconvene to formulate and recommend to the Commission, uniform state-wide business rules relating to the competitive offering of all metering services and functions. The Roundtable would review the general business rules from other jurisdictions and, wherever feasible, recommend rules that are compatible with those being utilized and considered in other jurisdictions. Phase One would commence on the date of the Commission's Order regarding this Report. On January 1, 2002, the CMRT will file another report with the Commission containing the business rules being recommended.

On January 1, 2002, a supplier or third party, in accordance with the statute and upon a customer's request, should be permitted to own and install meters for any commercial and industrial customers as long as the meter is compatible with utility metering technology. All parties, including the Electric Company, would consider the information provided by the meter official data.

Prior to January 1, 2002, and in accordance with the BGE, Allegheny and Conectiv Settlement Agreements, the Commission should initiate separate unbundled cost proceedings for each Electric Company to determine the provable costs associated with CM and to determine any cost recovery mechanisms that may be implemented. Phase Two would begin six months from issuance of a Commission Order approving the uniform statewide business rules.

II. PHASE TWO

Phase Two would result in the full unbundling and competitive offering of all metering services. Upon the occurrence of the latter of, six-months from the commencement of Phase Two, or when 10% of the C&I customers in the State are using meters owned by an entity other than the Electric Company, Phase Two will conclude and the Electric Companies will be precluded from providing any metering services to any commercial and industrial customers. Market participants will be given the opportunity to

bid on the provision of default metering services. The Electric Companies will only continue to provide default metering services and functions in the event that the Commission determines it to be necessary.

Phase Three will begin immediately upon conclusion of Phase Two.

III. PHASE THREE

Phase Three would conclude after achieving the full unbundling and competitive offering of all residential metering services. Upon the occurrence of the latter of, six-months from the commencement of Phase Three, or when 10% of the Residential customers in the State are using meters owned by an entity other than the Electric Company, Phase Three will conclude and the Electric Companies will be precluded from providing any metering services to any Residential customers. Market participants will be given the opportunity to bid on the provision of default metering services. The Electric Companies will only continue to provide default metering services and functions in the event that the Commission determines it to be necessary.

PART TWO

PHASED ALTERNATIVE TWO

I. Introduction

The Maryland Electric Customer Choice and Competition Act of 1999 provides for competitive metering. However, the term "competitive metering" is not defined in the statute. Conceptual definitions of "competitive metering" vary. Early concepts of competitive metering often paralleled service unbundling in the telecommunications and gas industries. In simplest terms, this assumes that various metering functions[4] can be provided better, more economically, or with more varied service options by a competitive party other than the utility.

Staff and the Companies[5] believe that this concept evolved from the earlier focus on the entity (utility or third-party supplier) that provides certain essential metering equipment and services to a new focus on the type of information that is metered or monitored, and how (and how quickly) the information is communicated to suppliers and customers. Many industry participants have replaced or supplemented the term "competitive metering" with the term "advanced metering." As discussed below, Staff and the Companies recommend an approach to competitive metering that both addresses the current statutory mandate for competitive metering and recognizes that there may be a longer term public interest requirement for a uniform utility owned advanced metering infrastructure to support demand responsive pricing[6] or distributed generation resources for a significant share of total system demand.

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[4] For example, the provision and maintenance of a meter and the process of reading the meter and making accurate usage information available for electric supply forecasting, scheduling, and billing.

[5] The Companies include Potomac Electric Power Company, Baltimore, Gas & Electric Company, Allegheny Power, and Conectiv.

[6] Please refer to Appendix A for further discussion of demand responsive pricing.

As described more fully below, Staff and the Companies recommend that the Commission approach competitive metering in several stages, the first of which would focus on the provision of meter information on a near real-time, on command basis and enable large (defined on a company specific basis) customers or a third party (with customer consent) ownership of the meter. Meter data accessed on a near real-time, on command basis will enable customers and suppliers to closely track actual usage and can enable suppliers to manage their risk in purchasing energy. Enabling energy consumption to become more sensitive to real-time price signals can bring the benefits of demand responsive pricing of electricity to suppliers and their customers. Therefore, this data can be of great value in emerging electricity markets. As the market for electricity in Maryland matures and as insight can be gained from suppliers' experience with competitive metering in other states, additional metering services may provide additional value to customers. This phased alternative provides the necessary flexibility for this emerging market to develop properly without prematurely imposing any significant costs on Maryland's consumers.

Staff and the Companies support the phase-in of competitive metering over several stages. Staff and the Companies' phased alternative will enable all of the market participants to study emerging markets and help guide the market development of those services that consumers appear to value the most. The phased alternative advocated by Staff and the Companies does not preclude the inclusion of any particular component of metering services from being part of the competitive product. Further, this alternative will avoid the expenditure of significant dollars without the necessary examination of the market and products that benefit consumers. Finally, the alternative recommended by Staff and the Companies is consistent with Maryland law.

As discussed below, states across the country have investigated competitive metering and come to varying conclusions. These conclusions have resulted in decisions that range from long-term policies to fully unbundle all utility metering service functions to short-term policies to monitor other states' concepts of competitive metering markets and the continuing evolvement of metering technology. California was the first state to introduce what is often thought of as competitive metering. They chose to sub-unbundle[7] all utility metering service functions. As discussed below, this approach has generated little participation and is reported to be problematic in a number of regards.

Pennsylvania provides another example of a state that has chosen to unbundle all utility metering service functions; however, Pennsylvania will not allow sub-unbundling, as does California. Implementation of the Pennsylvania competitive metering market is still pending as the market rules, processes, and transactions are still in the development stage. An interim step has allowed for the installation of advanced metering for all customer classes by the Pennsylvania distribution companies to increase the availability of interval consumption data.

Some states are now re-examining these initial approaches to competitive metering. In December 2000, the Virginia State Corporation Commission reported to its legislature that competitive metering should be deferred and that study of competitive metering markets should be continued. This year the Massachusetts Department of Telecommunications and Energy: (1) determined that metering-related services should *not* be unbundled and provided through a competitive market and (2) opened a proceeding to establish terms and conditions by which distribution companies will install advanced metering equipment.

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[7] Enabling each metering service function to be separately open to third-party provision of the service is often referred to as sub-unbundling. In other words, one third-party meter service provider may, for example, provide meter reading service to a customer while another may be providing meter data service to that same customer and yet another may be providing services to metering hardware located at that customer's site(s). (See Background section, part A.)

Given this preliminary research, it is evident that a definition of competitive metering based on mandatory unbundling of meter services requires a greater examination of the benefits that may flow to all parties — particularly as compared to the costs that will be incurred — as well as a greater examination of new developments in advanced metering and demand responsive pricing.[8] Some market participants believe that the future of competitive metering lies with a utility installed or supported advanced meter infrastructure that provides real-time usage information to the utility and suppliers using the utility's meter reading and information processing resources, while at the same time providing advanced energy management and power quality information directly to customers and suppliers.

The vision of competitive metering that may have been in effect when, for example, California implemented its market and when Maryland wrote its electric restructuring law has a broader, more complex context at the present time. Now, there is widespread acknowledgment of the value of metering data and its significance in emerging electricity markets. Staff and the Companies believe access to metering data and advanced metering service options appropriately satisfies the competitive metering requirement at this time.

In the longer term, the evolution of competitive metering may lead to a close association with default electric service, power reliability and quality, distributed generation, or state, regional, or national demand responsive pricing initiatives. There are many possible roads for competitive metering. One possible road leads toward competitive metering primarily benefiting individual customers or suppliers — with the resulting public interest conclusion of some form of unbundled metering with participants paying most or all of the implementation costs. Another road leads toward potential system-wide benefits in energy price, reliability or power quality. This road could lead to utility provided advanced metering initiatives with implementation costs borne more generally by all customers.

Because it is impossible to determine at this time the potential future road of competitive metering that will best serve the public interest, Staff and the Companies believe that the Competitive Metering Roundtable Working Group should continue to monitor industry developments, report on the current status of competitive metering in Maryland, the PJM region and elsewhere, and make recommendations on competitive metering to the Commission on an annual basis beginning in the Spring of 2002.

Currently in Maryland, as a result of electric restructuring settlements, all of the Companies have in various ways provided for choice in metering service function options. The current status of the relevant tariff for each company is attached as Appendix B. Upon adoption by the Commission of this phased alternative, the Companies will file as necessary, tariff revisions to enable large (defined on a company specific basis) customers or a third party (with customer consent) ownership of the meter. These tariff revisions will be filed to be in effect January 1, 2002.

II. Background

The background information that follows provides: (1) a discussion the role of metering data prior to and after restructuring; (2) an overview of information gathered on competitive metering in other states; (3) a discussion of national efforts at setting uniform business rules for competitive metering; (4) a brief discussion on the economics of today's metering market; and (5) a discussion of why access to

[8] Demand responsive pricing for a minority of customers may benefit all customers, and, consequently, some predict that distribution utilities will find it in their own interest to undertake advanced metering projects as essential distribution system upgrades.

metering data on a near real-time, on command basis has the potential to be beneficial to suppliers and in turn to customers.

A. Role of Metering Data Prior to and After Restructuring

Metering functions include, but are not limited to, installation, inventory management, meter procurement, meter engineering, technical support, metering equipment services, asset management services, meter field services (order receipt, dispatch, and fulfillment), meter reading, data collection, meter data management, usage data management, and data exchange.[9] These functions can be broadly grouped into three categories — Meter Services, Meter Reading Service, and Meter Data Service. Meter Services typically includes the physical services and hardware located at the customer's site(s). Meter Reading Service typically includes meter reading and reporting. Meter Data Service typically includes data management and exchange functions.

Under the proposal provided herein, an additional function, found to be required in states that have unbundled metering to include third-party meter ownership, that must be performed is the tracking and control of metering end-point market interrelationships. This responsibility typically has been performed by the incumbent utility, and may include the development of a database system for tracking meter identification number, meter ownership, and the meter's physical location. This crucial function is data intensive and is not easily accommodated by existing utility meter databases. Systems upgrades or replacements must be effected to accommodate this role.

Retail meters and the data derived from these meters prior to restructuring were used by the utility for customer billing data purposes, with pricing being based on approved retail electric service tariffs. This data was *not* used in settlement of the wholesale market. In general, total system load (including system losses) was determined by readings from generation and service territory interchange meters. This total load was reported to the PJM Interconnection, LLC powerpool[10] by 12 noon the day after in order for PJM to account for each company's hourly interchange.[11] The hourly interchange was settled at wholesale hourly market rates. While this determination of each company's total service territory system load still occurs, each company now must also determine the amount of load each alternative supplier is responsible for in each hour.

Under electric choice, customers may choose an alternate supplier for their source of generation. This means the load within a service territory must also be measured and settled using information from retail customers' meters. Each utility is required to use this retail metering data to allocate each supplier's contribution to the total system load. This is the key difference between load settlement prior to and after restructuring. This is also the reason why maintaining the integrity of the customer meter data has taken on a new level of criticality.

The utility is responsible for collecting all meter reads for all customers (regardless of who is supplying the customer's energy), grouping them by supplier, calculating customer usage on an hourly basis and aggregating this usage up to each supplier. This information is then transmitted to PJM where it

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[9] What is included in each utility's metering business varies, not only for those utilities in Maryland, but for all utilities.

[10] PJM is a centrally dispatched control area. PJM operates a regional, bid-based energy market. PJM enables participants to buy and sell energy, schedule bilateral transactions and reserve transmission service.

[11] Allegheny Power is not currently a member of PJM Interconnection, LLC powerpool. Allegheny Power reports load obligations to the AP Control Area Operator for the purpose of wholesale market settlement.

is compared to the actual hourly energy supplied into the pool by the supplier. The differences in supply versus usage are debited/credited to the supplier at the particular hourly market price.

B. Survey of States

Attached, as Appendix C is a matrix that surveys the status of competitive metering in other states. There are many variations on how to structure or shape a competitive metering market. California has unbundled metering functions to the greatest degree whereby a third-party meter service provider can provide any number of metering sub-functions. Other states such as Illinois and Pennsylvania, while also unbundling metering, have taken an "all or nothing approach." The "all or nothing approach" means that if any entity is going to provide metering services, they must provide *all* services. In other words, the utility (theoretically) no longer provides any metering services to a metering service provider's customer. Whether only providing one service (as is possible in California) or providing all metering services (as in Illinois and Pennsylvania), full risk and responsibility lie with the competitive provider. As discussed below, this risk has proved problematic in California resulting in the utility essentially having to "shadow" a number of meter service provider activities. Other states are moving forward into the competitive metering market through advanced metering provisions and open access to metering data; still others have chosen to defer competitive metering pending further study.

The cost to implement a competitive metering market varies according to the complexity of the market structure. For example, California's implementation costs related to metering have been estimated to be in the range of $17.6 million. Similarly, high costs could be incurred in Maryland by the Companies depending on the structure of the market and the business rules, processes and transactions that would need to be developed to support a given market structure. Also, as illustrated in the matrix, the development of business rules, processes and transactions is an involved endeavor that each state must undergo to appropriately address, for example, the particularities of their individual restructuring legislation, existing rules/practices for unbundled electricity supply, individual utility settlements, and business climate. Thus, while a great deal of information can be gleaned from those states that have gone through the complexities of developing extensive business rules, processes, and transactions, Maryland would also need to undertake such a structured process. Such a process could take from approximately one and one-half to two years to accomplish. Appendix D contains a list of issues that must be addressed in developing first the market structure and then the associated business rules, processes, and transactions. This list is provided as a starting point and should not be considered inclusive.

All competitive metering markets in this country are in the initial stages and are consequently unproven. California's competitive metering market has been in existence for the longest period of time, and as such, we are able to cite a recent study of this market. This study is attached as Appendix E.

➢ California

In September 2000, the Pacific Economics Group (PEG) issued a report on the third-party metering, billing and information (MBI) services experience in the state of California and followed up on a report prepared for the Edison Electric Institute in April 1999.[12] The report was designed to evaluate California's further experience with MBI services with particular attention to the potential market impact

[12] L. Kaufmann, *Third Party Metering, Billing and Information Services: Further Evidence from California,* Pacific Economics Group (Final Report, September 8, 2000).

of allowing third-party MBI services. According to PEG, the evaluation of these issues was quite difficult because there is little publicly available information on third-party MBI providers. Information compiled by the California Public Utilities Commission (CPUC) is confidential so it is not possible to know exactly how many MBI services are provided by third parties. Relationships between Utility Distribution Companies (UDCs) and MBI service providers are also generally confidential and not always subject to regulatory scrutiny. Because of the lack of public information, PEG took a two-pronged approach towards investigating MBI services in California. First, it utilized as much publicly available data as possible to make inferences on third-party MBI services. PEG then followed up on this information by extensively interviewing individuals with the most knowledge on this topic including people at California's three major UDCs, the CPUC, the California Independent System Operator, and some third-party MBI service providers. Despite these difficulties, PEG was able to glean some important facts about California's experience with third-party MBI, particularly third-party metering service.

- More than 2 years after the market for electric supply was opened (as of September 2000), only about 2% of retail customers had chosen third-party Electricity Service Providers (ESPs). Evidence exists that shows customer interest in third-party ESPs is declining rather than accelerating. In September 2000 more large customers had recently switched from third-party ESPs to the UDC for energy supplies than vice versa.

- Third-party Meter Service Providers (MSPs) and Meter Data Management Agents (MDMAs) have focused only on the largest customer segments. PEG estimated that California's three largest UDCs continued to provide metering services to over 99% of their customers.

- PEG found anecdotal evidence that ESPs were increasingly turning to UDCs rather than third parties for meter data management services. One reason given is that third-party MDMAs generally use more expensive telephony-based systems for meter reading and data management.

- While problems associated with meter installation by third parties were generally identified and fixed quickly, programming errors sometimes led to billing errors. There were also instances where, for customers returning to UDC energy supply service, meters installed by third parties were not compatible with UDC meter reading systems. This led to additional costs for meter reprogramming or new meters.

- Problems with third-party MDMAs were reported to be extensive and more difficult to resolve. PEG found anecdotal evidence that third parties are responsible for a disproportionate share of meter reading and communication mistakes, which have led to billing errors and adjustments. The problems could reportedly be attributed to several issues, including: MDMAs under-estimating the complexities of the California market; turnover at ESPs and within the market that led to a loss of institutional learning causing mistakes to be repeated; and difficulties enforcing compliance with data validation, editing and estimation (VEE) standards, particularly those designed to maintain data accuracy.

- UDCs had to be pro-active in identifying and rectifying MDMA problems, essentially becoming "shadow MDMAs" that must double-check the data provided by third parties.

- Billing adjustments resulting from third-party MDMA errors have occasionally led to customer dissatisfaction. Resolution of billing disputes involved "finger pointing" where no party wanted to take responsibility for metering service mistakes. PEG asserted that this demonstrates the problems that can occur when multiple parties have responsibility for ensuring data quality and integrity. Additionally, more ESPs were reportedly utilizing the UDCs for MDMA service because it is easier to negotiate and resolve billing problems.

- Many of the parties interviewed by PEG stated that care should be taken before unbundling MDMA services, at least at the outset of retail direct access. Several parties also expressed their belief that many of the benefits expected from third-party provision of MDMA services could be obtained through access to metered customer data rather than by allowing third parties themselves to provide these services.

➢ Pennsylvania

Although Pennsylvania has opted for an eventual "all or nothing approach" to competitive metering, an interim step has allowed for the installation of advanced metering[13] for all customer classes by the Pennsylvania distribution companies to increase the availability of interval consumption data. Additionally, to necessitate the potential availability of near real-time interval consumption data, several of these advanced metering installations have allowed for remote meter interrogation by licensed ESPs. This practice of advanced meters being installed and maintained solely by the distribution company will remain in effect until the eventual development and approval of statewide competitive metering business rules, processes, and transactions. As of March 31, 2001, over 100 advanced meters were installed by the Pennsylvania distribution companies.

It is worth noting that while the Pennsylvania Public Utility Commission (PaPUC) issued its final rules on competitive metering and the deployment of advanced metering in December 1998, as of March 31, 2001 no entity was certified by the PaPUC to provide competitive metering services

➢ Virginia and Massachusetts

Competitive metering has received the attention of a number of public service commissions throughout the country. Despite various state efforts to facilitate the development of competitive metering, no real market development or customer benefit has been demonstrated. Two current studies are of particular interest, as they are based on recent research in what is an evolving technological field and nascent economic market. These studies are:

[13] Per each distribution utility restructuring settlement, advanced metering in Pennsylvania is defined as a meter (1) capable of storing electric consumption data at specified time intervals of no greater than one-half hour and in conformance with applicable performance specifications, and (2) capable of remote meter reading.

(1) *Report to the Legislative Transition Task Force of the Virginia General Assembly Recommendation and Draft Plan Retail Electric Billing and Metering Services* from the Commonwealth of Virginia State Corporation Commission (December 12, 2000) (the "VA document"), and

(2) *Report to the General Court Pursuant to Section 312 of the Electric Restructuring Act, Capture 164 of the Acts of 1997 on Metering, Billing and Information Services* from the Commonwealth of Massachusetts Department of Telecommunication and Energy (December 29, 2000) (the "MA document").

These documents are attached as Appendix F.

In brief, the VA document reports that "there are simply no developed and successful competitive retail electric metering markets at the present time." VA document at 19. The document continues by stating that "[w]ith respect to residential and small commercial customers, substantial questions exist as to whether competitive metering can deliver benefits at the current time." *Id.* With regard to large customers "the resolution of complex detailed technical issues is still required to determine the best competitive structure for Virginia *and to ensure metering integrity*." *Id.* at 20 (emphasis added). In summarizing, the Virginia State Corporate Commission recommended that "[i]n view of the complexities and resulting uncertainties surrounding competitive metering, including the limited market activity nationwide, the Commission believes that legislative action to restructure retail electric metering service should be deferred." *Id.* at 22.

The MA document reports that, "one might surmise that competition in metering-related services would lead to technological advances to metering equipment being installed at the facilities and homes of customers" because competitive markets have more incentive than regulated markets to innovate. MA document at 12. However, the MA document concludes, "public policy requires more than surmise to warrant so radical a departure from time-honored practice." *Id.* In response to this document the Department of Telecommunications and Energy of Massachusetts, in an order dated February 8, 2001, opened an investigation intended to result in the development of generic terms and conditions for the provision of advanced metering services by the Massachusetts electric distribution companies. This is consistent with what was stated in the MA document; that the installation of advanced metering equipment by the electric distribution companies will likely yield substantial benefits to electricity consumers sooner than would fully unbundled metering service options. D.T.E. 01-28 (2001).

C. National Efforts towards Uniform Business Rules

Proponents of fully unbundled competitive metering often cite the efforts of the Coalition for Uniform Business Rules (CUBR) and the electricity metering subgroup of the Uniform Business Practices (UBP) group[14] to standardize unbundled metering practices as support for their belief that the fully unbundled model for competitive metering should – and can – be implemented in Maryland. However, these business rules and practices are primarily applicable to the fully unbundled model for competitive metering. Furthermore, upon careful reading, it is clear that the drafters of these uniform business rules did not intend to presuppose a determination that full unbundling is warranted. Finally, these uniform business rules could serve as a guide to drafting rules specific to this state. However, significant time and

[14] The UBP group is an organization sponsored by the Edison Electric Institute (EEI), the CUBR, the National Energy Marketers Association (NEM) and the Electric Power Supply Association (EPSA).

effort would still be necessary to ensure that these rules compliment practices, rules, and protocols already in place in Maryland.

As explained throughout this report, the ideas behind and benefits associated with competitive metering have evolved over time. The CUBR rules for competitive metering issued in September 1999 and the UBP version issued in December 2000 were both developed during a period when the fully unbundled model, employed by, for example, California and Pennsylvania, was the prevailing view on how best to implement competitive metering.[15] However, as evidenced by the recent determinations of the Massachusetts Department of Telecommunications and Energy and the Virginia State Corporation Commission, views on competitive metering have changed such that the uniform business rules developed may not be applicable to all prospective competitive metering models.

Indeed, while these rules were developed for the fully unbundled model, even the drafters of the CUBR and UBP documents did not necessarily advocate this model as ideal for all states. For example, the CUBR document states that it does not address "which services, such as billing and metering, should be competitive; or if, and to what extent, there should be unbundling." CUBR at 2. The objective of the UBP electricity metering subgroup is spelled out clearly at the beginning of its report:

> The overall objective of the UBP unbundled electricity metering subgroup is to produce a set of uniform business practices for unbundled metering within the retail electricity market. The process of developing a set of uniform practices is neither an endorsement nor a rejection of the policy choice to implement unbundled electricity metering. Rather, these practices have been developed to facilitate the business process when, and if, this policy direction is taken by a state. UBP at 8.

The report continues by clarifying that it "does not attempt to prescribe a particular market structure for unbundled electricity metering . . ." and advises that "the market structure that is eventually implemented *should strive to promote the benefits of customer choice, maintain the integrity of metering and billing processes* and minimize the potential for conflicts of interest to arise." UBP at 16 (emphasis added).

Finally, the CUBR and UBP uniform business rules for competitive metering were drafted in conjunction with business rules for numerous other aspects of the competitive electric – and natural gas – markets. The CUBR report presents rules for ten closely related areas, including metering. A footnote on every page of the CUBR report states that "[T]he CUBR document should be considered in its entirety." The uniform business practices for competitive metering of the UBP electricity metering subgroup were also drafted in conjunction with the business practices for all other facets of a competitive retail electricity market. Because retail electric choice began in Maryland on July 1, 2000, the necessary business rules and practices have already been developed and implemented. Thus, if applicable, the CUBR and UBP rules for competitive metering would still need careful examination to ensure that they are compatible with the numerous rules, protocols, and practices currently associated with Maryland's competitive electric market.

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[15] Coalition for Uniform Business Rules (CUBR), *Standards for Uniform Business Rules Version 1.1* (September 1999) and *Uniform Business Practices for the Retail Energy Market: Volume 2, Uniform Business Practices for Unbundled Electricity Metering* (UBP), Edison Electric Institute (December 2000). These reports can be found in their entirety at http://www.cubr.org/work_product_original/default.htm and http://www.ubpnet.org/workshop/index.htm.

Therefore, the mere existence of these business practice rules should not dictate that the fully unbundled model is the best model for competitive metering in Maryland; or would their existence eliminate the large amount of work necessary to apply these rules to the Maryland electric choice market.

D. Economies of Scope and Scale

The metering business as a whole lends itself to economies of scope and scale. Scope economies occur when multiple functions are provided by a single entity. Scale economies occur with a single source provision of services to a large number of similar customers and the greater the density of the similar customers the greater the economies of scale.[16]

In a low-margin business such as metering, allowing open access to metered consumption data enables the development of value-added services and real customer benefits. Opening the market to competitive metering should not undermine the customer benefits realized through economies of scope and scale.

There are also important operational advantages when metering and distribution remain integrated. Meter-related activities work in relation to true distribution functions. Operational benefits could include, but are not limited to: an enhanced ability to locate faults and determine whether it's a distribution problem or a metering problem; rapidly dispatch service crews to restore power; optimize substation maintenance; reduce line losses; and improve distribution planning. This in turn enhances overall reliability. These are all unit cost reductions that result when a single firm provides two services (e.g., metering and distribution). If meter unbundling occurs prior to the metering market being ready (technologically or otherwise) economies of scope are lost.

E. Access to Metering Data

Currently, the Customer Choice rules in Maryland require consumption data to be provided at the time of billing on a normal billing cycle basis. Staff and the Companies believe that it is access to consumption data on a near real-time, on command basis that will assist suppliers with, for example: providing more sophisticated price signals (e.g., time-sensitive signals) to customers; procuring electricity (i.e., through improved forecasting and reduced risk); and developing price responsive markets. Making energy consumption more responsive to real-time price signals will bring the benefits of the hourly pricing of electricity to suppliers who can in turn provide this benefit to their customers. It is because metering data is the foundation for financial settlements of all market participants that the Companies are concerned that metering data integrity is ensured. As recognized by all roundtable participants, a significant breach in metering data integrity could seriously damage or undermine the restructuring effort. Staff and the Companies agree with the finding of the Virginia Commission that "it is critically important that a decision to restructure retail electric metering be accompanied by a reasonable level of confidence that such integrity can be maintained." VA document at 20. Thus, at this time, providing for access to metering data appears prudent. It will allow for the opportunity to examine the potential for economic

[16] The degree of magnitude of scope and scale economies can be demonstrated by the avoided cost. If the avoided cost is low relative to the embedded cost, the economies of scope and scale are significant. Significant scale economies are consistent with intense competition if the size of the market is large enough. Firms can therefore prosper in low-margin businesses when the production technology displays significant scale economies and markets for the services are extensive. Further, if the utilities remain the provider of last resort, infrastructure costs will not be avoided, as metering systems would have to be maintained.

benefits to flow from additional competitive metering offerings and will allow for the necessary flexibility for this emerging market to develop without imposing any significant costs on consumers.

It is with this background that Staff and the Companies support this phased alternative to competitive metering.

III. Recommended Alternative for Maryland

Staff and the Companies recognize that competitive metering could entail any number of services across a full spectrum, from the critical element of providing data to all competitive metering services, which could include meter installation, maintenance, testing, reading, reporting, data maintenance, data validation, and data estimation. The phased alternative advocated by Staff and the Companies does not preclude the inclusion of any particular component of metering services from being part of the competitive product. This phased alternative does, however, enable all players in this market the opportunity to: monitor industry developments; report on the current status of competitive metering in Maryland, the PJM region, and elsewhere; and help guide the market development of those services that consumers value or that provide a high likelihood of reducing total energy costs for all customers.

Further, this alternative will not require the expenditure of significant dollars without the necessary examination of the market and products that will benefit consumers. Finally, the alternative recommended by Staff and the Companies is consistent with Maryland law.

Staff and the Companies recommend the Commission approach competitive metering in several stages, the first of which would focus on the provision of meter information on a near real-time, on command basis and would enable large (defined on a company specific basis) customers or a third party (with customer consent) ownership of the meter. Meter data accessed on a near real-time, on command basis will provide suppliers, and customers, with the necessary information and the proper incentives to adjust their consumption patterns based on price signals (demand responsive pricing) and to manage risk in procuring energy. Potential benefits associated with demand responsive pricing could include:

- price reductions, both at the wholesale and retail levels;
- improvements in the accuracy of supplier forecasting and scheduling of MW loads (by having acquired more precise and detailed information with respect to customer usage as a function of price);
- reduction of supplier exposure with regard to wholesale market financial settlement (i.e., there is less usage differential on the part of suppliers at the time of wholesale market financial settlement provided through less reliance on load profiles and more reliance on interval data);
- opportunity for the development by suppliers of new products and services (e.g., multiple pricing options); and
- incentives for investment in energy efficiency measures.

It is near real-time meter data that is proving to be of the most value in emerging electricity markets. As the market for electricity in Maryland matures, additional metering services may provide additional value

to customers. This phased alternative provides the necessary flexibility for this market without imposing any significant transition and transaction costs on consumers for the development of the market.

As competitive metering is expected to continue to evolve, this proposal recognizes that competitive metering is likely to be closely related to other post-transition period issues over time. The Companies will either have completed or be completing the transition period for their non-residential classes within three (3) years (depending on each company's restructuring settlement). It is not clear to Staff and the Companies what demand for competitive metering will exist no matter how competitive metering is approached. Within that time, however, the Companies may file rate cases (following the rate cap/freeze periods), or, OPC or Staff may see fit to request such an action. This could have tremendous impact on the then evolving status of competitive metering.

Just as the early understanding of competitive metering has become much more complex with the more recent addition of real-time data transfer and advanced demand responsive metering issues, each of the possible future generation supply and metering scenarios places utility metering in different public policy roles. Many of the policy issues can only be hypothesized now. One scenario, which differs markedly from the traditional concept of competitive metering, would require the distribution utility to be the one to provide advanced metering to all or most customers. Another very different scenario would lead to the full unbundling of the numerous revenue cycle (metering and billing) related functions. Because of the close relationship between revenue cycle functions and energy supply for mass-market customers, the Commission may wish to consider the future of competitive metering for the majority of customers in light of other developments in electricity supply markets.

A. Implementation per Statutory Dates

Under this recommended alternative, each company would provide for access to data on a near real-time, on command basis to customers or a third party (subject to customer consent) per the statutory dates (January 1, 2002 for large customers and April 1, 2002 for all other customers). This could entail read-only access to advanced meters or sending a stream of data pulses proportional to energy usage. The company would continue to provide all metering services[17] on all equipment that they own. The Companies will provide metering services to customer or third-party-owned equipment. The Companies will be responsible for collecting and processing the data required for billing and settlement purposes from all revenue meters. No utility metering cost would be avoided and therefore no credits will be paid to customers.[18] There are, however, hardware-related costs to implement the necessary technical processes to make data available on a near real-time, on command basis. Such costs may include the costs of communication lines, cell phone equipment and operational expenses, security firewalls, and all other time and materials for meter upgrades. Cost-based fees will be imposed on the specific entity or customer requesting upgrades and causing the costs to be incurred.[19] Therefore, there would not be a widespread imposition of costs on customers who are not receiving corresponding benefits.

Also, under this recommended alternative, each company will enable customer or third party (with customer consent) ownership of the meter. Currently in Maryland all of the Companies have in various ways provided for choice in metering service function options. Upon adoption by the

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[17] Metering services include, but are not limited to, installation, maintenance, testing, reading, reporting, data maintenance, data validation, and data estimation.

[18] As part of individual utility settlements and subsequent regulatory actions, there may be riders or tariff provisions that provide for credits in certain situations.

[19] The Companies will file the necessary tariff revisions for cost-based fees to be in effect January 1, 2002.

Commission of this phased alternative, the Companies will file as necessary, tariff revisions to enable large (defined on a company specific basis) customers or a third party (with customer consent) ownership of the meter. These tariff revisions will be filed to be in effect January 1, 2002.

B. Further Implementation

Key issues and principles must be addressed in evaluating the inclusion of other components of metering services in the competitive metering product and subsequently toward development of a metering market structure and business rules, processes, and transactions. The Uniform Business Practices (UBP) group's document notes several key policy issues (not resolved by the UBP group) impacting unbundled metering practices that it recommends regulators consider prior to, or in conjunction with, considering the development of business rules, processes, and transactions. They include, but are not limited to: the provider, purpose, form, and pricing of default metering service; the risks associated with being the provider of default metering service (i.e., will the risk be reflected in the price of service and will the risk be addressed in the terms and conditions); defining the interrelationships among the entities participating in the competitive market (this is critical to the end-use customer); meter infrastructure control; possible conflicts of interest; customer metering service preferences; market structure viability; level of meter service unbundling; needed changes to computer systems; shifting of financial risk; licensing of unbundled meter service providers (i.e., certification criteria and licensing process); license revocation; line of demarcation; and service deliver points.[20] Additionally, key principles that must be maintained include, but are not limited to: the safety of customers, employees, equipment; the reliability of service; quality and integrity of metering information as this is the data used for billing and load settlement; and the security of metering equipment.

Staff and the Companies recommend that the Commission continue to periodically examine the competitive metering market through the Competitive Metering Roundtable Working Group. This would enable the opportunity for interested parties to engage in a substantive discussion and examination of:

- the potential for benefits to flow to customers from additional competitive metering market offerings on a sustained basis;
- how transition and transaction costs incurred through the implementation of additional competitive metering market offerings may best be recovered;
- the development of other markets;
- whether any potential benefits outweigh the costs and risks associated with the complexities of the metering infrastructure and metering data as it impacts, for example, billing, load settlement; and
- utility distribution activities.

Staff and the Companies suggest the following list of principles be adopted. This list provides a framework for the Competitive Metering Roundtable Working Group to work within that will guide the authorization of competitive metering to enter further phases.

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[20] *Uniform Business Practices for the Retail Energy Market: Volume 2, Uniform Business Practices for Unbundled Electricity Metering,* Edison Electric Institute (December 2000).

- Be consistent with the goal of facilitating the development of effective competition in electric service for all customer classes;

- Take into account the readiness of customers and suppliers to buy and sell metering services;

- Take into account the economic and technological feasibility of furnishing any metering services on a competitive basis;

- Take into account the possibility that metering service options that facilitate demand responsive pricing for some customer classes might lower electric costs for all customers;

- Take into account whether reasonable steps have been or will be taken to educate and prepare customers for the implementation of competition for any metering services;

- Not jeopardize the safety, reliability or quality of electric service;

- Consider the degree of control exerted over utility operations by utility customers;

- Not adversely affect the ability of an incumbent electric utility authorized or obligated to provide electric service to customers who do not buy metering services from competitors to provide electric service to such customers at reasonable rates; and

- Give due consideration to the potential effects of such determinations on utility tax collection by state and local governments in Maryland.

C. Transition Costs

Staff and the Companies recommend that the Commission implement competitive metering as proposed above. Until the market has been examined further, it would be premature to propose a market structure or to determine which metering services should be provided through a competitive market. Transition costs for the implementation of competitive metering pursuant to Public Utility Companies Article, Section–511(a) as proposed are expected to be minimal. However, as discussed earlier, costs for any expansion of competitive metering beyond what is being proposed herein are expected to be significant. Staff and the Companies believe that a competitive metering market as attempted, for example, in California and Pennsylvania would, at this time, impose significant costs on all consumers without commensurate benefits. Staff and the Companies do not want to operate under the premise used in such states as California or Pennsylvania: build it and they will come.

The recommendation proposed herein is a measured approach to introducing competition into an electricity services sub-market. This alternative significantly reduces transition and transaction costs. Transition costs related to competitive metering have generally been exempted from all other transition costs covered in the overall restructuring settlements. Therefore, Staff and the Companies recommend that the Commission establish provisions that will enable the Companies to petition the Commission for all prudently incurred, verifiable, and non-mitigable net competitive metering related transition costs at such time as they may occur.

D. This Alternative is Consistent With Maryland Law

Section 7-511(a) provides that competitive metering for large customers shall begin on January 1, 2002 and for all other customers on April 1, 2002, or earlier if requested by the electric company.[21] The term, "competitive metering," however, is not defined in the statute. Therefore, it is within the Commission's discretion to adopt a vision of competitive metering that benefits all consumers in the state of Maryland. The Commission may choose to define competitive metering as a spectrum of services that range from the provision of data on a near real-time, on command basis, to the provision of all meter services, which could include ownership, maintenance, and reading of the meter. For the numerous reasons discussed in this report, Staff and the Companies urge the Commission to adopt this phased alternative to competitive metering as being in the best interest of electricity consumers in the state of Maryland.

Section 7-505(a) of the Public Utility Companies Article is imperative to the Commission's review of competitive metering. That Section states:

> Overseeing the transition process and regulation of the restructured electric industry, the Commission shall provide that the transition to a competitive electricity supply and electricity supply services market shall be orderly, maintain electric system reliability, and ensure compliance with federal and State environmental regulations, be fair to customers, electric company investors, customers of municipal electric utilities, electric companies, and electricity suppliers, *and provide economic benefits to all customer classes.* Section 7-505(a) (emphasis added).

Based on the language noted above, the Commission in its consideration of competitive metering must consider the impact on consumers, electric companies and meter service providers as well as the economic benefits of a competitive metering market.

The alternative to competitive metering advocated by Staff and the Companies complies with Sections 7-511(a) and 7-505(a). It provides the essential access to data and takes into account all the factors enumerated in that section, including the economic benefits of a competitive metering market to all customer classes. Further, this alternative will enable large (defined on a company specific basis) customers or a third party (with customer consent) ownership of the meter. The Companies and Staff assert that the definition of competitive metering is within the discretion of the Commission and should be defined as provided herein. This allows for careful consideration of the economic benefits of the developing market while providing the metering services that consumers in other states have demonstrated a desire to purchase.

IV. Summary of Recommendations

In summary, Staff and the Companies recommend the following to the Commission:

- The implementation of competitive metering pursuant to Public Utility Companies Article, Section–511(a), should provide for access to meter information on a near real-time, on command basis.

[21] Public Utility Companies Article, Section 7-511(a).

- The implementation of competitive metering pursuant to Public Utility Companies Article, Section–511(a), should enable large (defined on a company specific basis) customers or a third party (with customer consent) ownership of the meter. The Companies should make tariff revisions, as necessary, to be effective January 1, 2002.

- The Commission should order the Competitive Metering Roundtable Working Group to conduct an ongoing examination of the competitive metering market and make recommendations to the Commission on an annual basis beginning in the Spring of 2002. This would enable the Working Group to (1) monitor industry developments, (2) report on the current status of competitive metering in Maryland, the PJM region, and elsewhere, and (3) help guide the market development of those services that customers value or that provide a high likelihood of reducing total energy costs for all customers.

- The Commission should adopt the following principles to guide the Competitive Metering Roundtable Working Group in their continued examination of the evolving competitive metering market:

    - Be consistent with the goal of facilitating the development of effective competition in electric service for all customer classes;

    - Take into account the readiness of customers and suppliers to buy and sell metering services;

    - Take into account the economic and technological feasibility of furnishing any metering services on a competitive basis;

    - Take into account the possibility that metering service options that facilitate demand responsive pricing for some customer classes might lower electric costs for all customers;

    - Take into account whether reasonable steps have been or will be taken to educate and prepare customers for the implementation of competition for any metering services;

    - Not jeopardize the safety, reliability or quality of electric service;

    - Consider the degree of control exerted over utility operations by utility customers;

    - Not adversely affect the ability of an incumbent electric utility authorized or obligated to provide electric service to customers who do not buy metering services from competitors to provide electric service to such customers at reasonable rates; and

    - Give due consideration to the potential effects of such determinations on utility tax collection by state and local governments in Maryland.

- The Commission should establish provisions that will enable the Companies to petition the Commission for all prudently incurred, verifiable, and non-mitigable net competitive metering related transition costs at such time as they may occur.

APPENDIX A

Retail-Load Participation in Competitive Wholesale Electricity Markets

APPENDIX B

Current Company Competitive Metering Provisions

CURRENT COMPANY COMPETITIVE METERING PROVISIONS

Non-standard and Advanced Metering Provisions:

The Companies have approved provisions for non-standard and advanced metering services that would continue to remain in effect. These provisions provide choice with regard to metering services to suppliers and customers. Upon adoption by the Commission of this phased alternative, the Companies will file as necessary, tariff revisions to enable large (defined on a company specific basis) customers or a third party (with customer consent) ownership of the meter. These tariff revisions will be filed to be in effect January 1, 2002.

- **Baltimore, Gas & Electric Company:** *BGE Electric Retail Tariff Rider No. 23 Advanced Meter Services.* Per Part A of this Rider, all non-residential customers with an annual maximum demand of 500 kW or more are eligible to have advanced metering, which they will own, installed at their facility. The customer, or a third party supplier, will pay for any such meter. Currently, this provision expires on April 1, 2002. Thus, Part A of this Rider enables ownership of the meter by either the customer or a designated third party for those customers with an annual maximum demand of 500 kW or more. With some modifications, BGE will file to have the date extended. Per Part B of this Rider, for any customer, BGE will install a basic advanced meter and telephone/cellular phone package where cellular service is available. The customer may own the telecommunication equipment. This Rider has been in effect since July 2000. As of March 1, 2001, no customers have elected to own their own meter per Part A of this Rider; one customer has elected to have an advanced meter installed per Part B of this Rider. See BGE's tariff for the precise text.

- **Allegheny Power:** *AP Tariff No. 53, Rules and Regulations, No. 10(i) & (j).* Allegheny Power shall own and install metering equipment for any customer requesting non-standard metering. The customer shall pay all costs associated with the removal of existing metering equipment, the installation and testing of the non-standard metering equipment, the installation/operation/maintenance of the required communication/telephone link, and all incremental costs of non-standard metering services above those charges for standard metering. Any meter installed and owned by Allegheny Power shall be used for billing, capacity obligation determination, transmission obligation determination, and energy reconciliation. Additionally, demand pulse signal and/or synchronizing time signals will be provided by Allegheny Power to the customer upon request. The customer makes a one time payment for the installation of wiring and equipment necessary to provide the signals,

and pays a monthly charge for the incremental difference between any special metering required to provide the signals and the metering normally required to furnish the information necessary to bill the customer. See Allegheny Power's tariff for the precise text.

- **Delmarva Power & Light Company:** Delmarva has an approved metering rider, which allows customers over 300 kW to own metering equipment. Delmarva continues to read the meter through dedicated, customer installed, telemetering equipment meeting Delmarva specifications. The customer may elect to have a separate line installed for their specific meter reading needs. There is a one time initial fee based on the average net book value (net salvage) of the type of meter installed at the customer's facility. The customer will retain legal title to the meter and telemetering equipment and shall be responsible for the cost of repair, replacement, maintenance, testing, taxes and risk of loss. The customer shall also be responsible for installing and maintaining a dedicated phone line that will permit Delmarva to have telephone access to the meter. Electronic access to the meter shall be by a password-protected system. The company shall have the right, through password protection, to secure the integrity of the portions of the telemetering equipment required to record and store information required for billing. Full details of the provision are in the Delmarva Rider "MMR."

- **Potomac Electric Power Company:** *Electricity Supplier Coordination Tariff, Section 13 Company-Supplied Metering Services.* Per Subsection 13.3, the Company shall own and install equipment for any Electricity Supplier requesting Non-standard Metering. The Electricity Supplier shall pay all estimated costs associated with the removal and testing of any existing electric metering equipment, the installation and testing of the Non-standard Metering equipment, and all estimated incremental costs of Non-standard Metering services above those charges that the Company has included in its tariffs for standard metering. Any meter installed and owned by the Company shall be used for billing, capacity obligation determination, transmission obligation determination, and energy reconciliation. All meters used for billing, will be maintained and tested by the Company in accordance with Commission regulations. The Company shall provide, but the Electricity Supplier shall pay, for the installation, operation and maintenance of the required compatible communication/telephone link in order to transmit the metered information to the Company. As long as it does not interfere with the Company's operations, the Electricity Supplier may opt to install its own communication link for its own interrogation purposes. See Pepco's tariff for the precise text.

APPENDIX C

Survey of States Matrix

APPENDIX D

List of Market Structure and Implementation Issues

LIST OF MARKET STRUCTURE AND IMPLEMENTATION ISSUES

1. Are customers required to participate in the retail generation supply market in order to participate in competitive metering?
    - If yes, will competitive metering be available only through the generation supplier, or is it available from third parties?
        - If competitive metering is available only through the generation supplier:
            - Are competitive metering providers allowed any direct contact with the customer?
            - What entities does the utility distribution company recognize?
            - Is the default metering provider the utility distribution company, or the generation supplier?
                - Utility distribution companies not obligated to install any metering above the current requirements of the customer rate class. Would this extend to the generation supplier?
    - Regardless of eligibility rules concerning customer generation shopping status, if third party competitive metering is available:
        - How is communication handled between all parties?
            - How does a generation supplier and/or competitive meter supplier "pending" status affect communication?
        - How are existing parties informed if there is a new entrant into the generation supply market and/or competitive metering market?
    - For multiple-metered accounts, can there be more than one competitive meter supplier per account?
2. Is the utility distribution company able to participate in the competitive metering market?
3. Does competitive metering include all services (i.e. meter ownership, meter reading, meter data management)?
    - If meter ownership is included:
        - What parties (including the customer) are allowed to own the meter?
        - What equipment is included in the meter ownership?
        - Is ownership at the premise level or customer level?

- Does ownership include costs for installation, future removal, maintenance, testing, etc?
    - What are the restrictions of when a meter can or cannot be installed?
    - What are the requirements to ensure adherence to all state and federal regulations regarding meter maintenance?
    - Who is allowed to request a meter test and under what circumstances?
        - Are fees imposed for meter tests?
        - What are the meter accuracy and witness requirements?
        - What are the reporting requirements, and to which parties?
- What is the line of demarcation between the regulated utility service and the competitive metering service?
    - Who owns the CTs/PTs?
    - Who owns the service entrance cable?
    - Who owns the meter socket?
    - Who is responsible for the wiring from the CTs/PTs to the meter socket?
- What types of meters are eligible?
    - Manually-read meters?
    - Interval meters only?
    - Interval meters only with remote interrogation capabilities?
    - Are visible demand/energy registers required?
- Will eligible meters be associated with customer class and/or size of customer?
- What existing meters are eligible for competitive metering?
- For new competitive meters:
    - What is the approval process?
    - What are the performance and standards criteria?
- Who implements and is responsible for costs associated with changes in state, federal and/or NEC standards?

- If meter reading is included:
    - What are the liability and accountability criteria for accurate reads to ensure meter data quality and quantity?
    - Are meter reading cycle changes allowed? If yes:
        - Must the meter reading cycle change conform to one of the existing utility distribution company meter reading cycles?
        - If true monthly billing is not an existing meter reading cycle, is it allowed and under what circumstances?
    - How are off-cycle meter reads requested?
    - Are there restrictions as to who can interrogate the meter, and how often?
- If meter data management is included:
    - Who stores the historical meter data?
    - Who has the responsibility for providing historical meter data?
    - Who owns the meter data?
    - Who has access to the meter data?
    - What are the data retention and maintenance requirements?
    - What are the standards for data validating, editing and estimating (VEE)?
        - To ensure proper VEE routines, what communication is required to determine whether a lack of data is due to a meter failure, a communications link failure, or simply a scheduled and/or unscheduled interruption of service?
    - What are the data exchange standards?
        - Is the exchange a data stream or bill-ready determinants?
            - If it's bill-ready determinants, what is the standard (i.e. 15-minute interval)?
        - Will data be posted to a centralized server?
        - Will all metering data be transferred via EDI or XML? If yes:
            - Is there a need for new EDI or XML transactions?
            - If bill-ready determinants and interval meters are required, should all interval data be transferred or only summary data if

the customer is billed on a single maximum peak kW rate schedule?

- If competitive metering is available from third parties, how will continuity of the meter data transfer be ensured with the generation supplier? For example, do competitive meter suppliers have to test the electronic transfer of information with *every* licensed generation supplier in the state?

- What is the data transfer schedule for the posting or transmittal of meter data?
  - How does the data transfer schedule affect the billing window?
  - What accountability is required to ensure the data transfer schedule obligations are met?
  - How do off-cycle reads affect the data transfer schedule?
- How are adjustments made for inaccurate meters or incorrect meter reads?
  - How and what information is transferred between all parties?
  - How does it affect billing?
  - What is the process for cancels and re-bills when there is more than one competitive meter supplier over multiple billing periods?
- What are the continuity of data issues when there is a change in generation supplier and/or competitive meter supplier?

4. If competitive metering includes all services (i.e. meter ownership, meter reading, meter data management), are all the services provided through one supplier?
   - If yes, is the competitive metering supplier allowed to sub-contract?
   - If no, is each service a separate entity with a separate contact allowed directly with the customer and/or the generation supplier?
     - Does the customer have to select "all or none" of the entities to eliminate utility sub-unbundling?
5. How are utility distribution company meter credits designed and applied?
   - How do the credits affect competitive billing?
   - If third party metering is allowed, do consolidated billing entities include metering charges?
     - If so, what charges are allowed (i.e. basic metering charges versus non-basic metering charges)?

6. What are the enrollment standards?
    - Does enrollment follow rolling switching rules?
    - Is it first-in enrollment or last-in enrollment?
    - Are meter changes allowed if there is a "pending" generation supplier?
    - What type of customer authorization is required by a competitive meter supplier?
    - Who does the customer contact to request a change or discontinuance of the competitive meter supplier?
7. Who is responsible for continuity of service?
    - If there is an emergency:
        - Who handles equipment problems related to fire, flood, etc.?
        - Who disconnects the meter in the event of fire, flood, etc.?
        - What coordination is required between the competitive meter supplier and the utility distribution company?
    - If there is a metering equipment failure which interrupts service to the customer, what are the timing and repair requirements?
    - Are physical disconnects allowed for non-payment of competitive metering charges?
        - Who is allowed to perform the disconnect?
        - What coordination is required for transformer rated meters versus non-transformer rated meters?
        - Are there any issues related to moratoriums?
        - Are there any changes required for notification?
    - What are the additional reliability issues?
    - What are the safety issues and legal liabilities?
    - Will seamless moves be addressed?
8. How will theft-of-service be handled with competitive meters?
    - What parties are involved in an investigation?
    - What information (if any) is distributed to other parties without violating customer confidentiality?

- Who is responsible for legal and other costs associated with prosecution of theft-of-service?

9. What are the licensing and certification requirements?

    - If competitive metering is only available through a generation supplier, is additional licensing and/or certification needed for the generation supplier?

    - If competitive metering is available from third parties:

        - Does the competitive metering supplier have a separate licensing and certification requirement, or is it in addition to the generation supply licensing and certification?

        - If sub-contracting is allowed, does each sub-contractor have to be licensed and certified?

    - What are the credit and bonding requirements?

10. What insurance requirements and safety/training qualifications are required for competitive metering employees?

    - What is the personnel certification training?

    - What are the corporate standards and eligibility?

    - What are the employee standards (such as background checks)?

11. What is a *realistic* timeframe to implement competitive metering?

    - What is the anticipated duration to develop all the business rules, processes and transactions?

        - What experience and information can be garnished from other states?

        - What are the major roadblocks?

    - What is the anticipated duration to implement the business rules, processes and transactions into the utility distribution company legacy systems?

    - What safety nets are in place to allow for project slippage?

    - What (if any) are the periodic reporting requirements?

12. What entity or entities are responsible to provide data to PJM?

13. Who is the watchdog to ensure compliance?

    - What are the liability and performance standards by which a competitive meter supplier must maintain to prevent a return to default metering?

    - How are disputes and/or complaints handled?

        - Between either the customer and the competitive meter supplier?
            - What are the consumer protection issues and the complaint mechanism?
        - Between either the utility distribution company and the competitive meter supplier?
        - If third party metering is allowed, between either the generation supplier and the competitive meter supplier?
    - What are the enforcement standards?
    - What are the remedies and compensation for parties affected by those that violate compliance?

14. Who is responsible for consumer education?

15. How will stranded asset and cost recovery be addressed?

16. How do agreed upon business rules, processes and transactions for competitive metering affect competitive billing?

APPENDIX E

California Study

APPENDIX F

Virginia and Massachusetts Documents

Appendix F: From the Following Web Sites:

Virginia document: http://www.state.va.us/scc/caseinfo/orders/case/mbplan_e000346.pdf

Massachusetts document: http://www.state.ma.us/dpu/gas/00-41/MBIS_Final_Report.htm