BEFORE THE
PENNSYLVANIA PUBLIC UTILITY COMMISSION

Petition of Duquesne Light Company	:		
For Approval of Its Final Smart Meter	:	Docket Nos.	P-2012-_____
Procurement And Installation Plan	:		M-2009-2123948

PETITION OF DUQUESNE LIGHT COMPANY FOR APPROVAL OF ITS FINAL SMART METER PLAN

I. INTRODUCTION

Duquesne Light Company ("Duquesne Light" or the "Company") hereby files its Petition for Approval of Final Smart Meter Procurement and Installation Plan ("Final Smart Meter Plan" or "Plan") pursuant to the Order of the Pennsylvania Public Utility Commission ("Commission") entered on May 11, 2010 and the Secretarial Letter issued on December 13, 2011 at Docket No. M-2009-2123948.[1]

The Commission approved Duquesne Light's Initial Smart Meter Plan, with certain modifications, by Order entered May 11, 2010. Since then, the Company made a series of milestones filings with the Commission that provided important information regarding the status of the Company's smart meter technology implementation plan, as detailed below. Duquesne Light has also conducted multiple stakeholder meetings with Commission staff and parties to advise them of developments regarding the Company's Plan and to seek input regarding potential issues.

Duquesne Light's Final Smart Meter Plan is based upon the extensive assessment that the Company conducted since the Commission approved the Company's Initial Smart Meter Plan

[1] By the May 10th Order, Duquesne Light was permitted to file a final smart meter plan by December 31, 2012. Per the Company's request, a six month extension was granted permitting the Company to file its Plan by June 30, 2012. See Secretarial Letter issued on December 13, 2011 at Docket No. M-2009-2123948.

and the input it has received from Commission staff and interested parties. A copy of the Final Smart Meter Plan is provided with this Petition. For the reasons explained herein, Duquesne Light's Final Smart Meter Plan is in the public interest and should be approved.

II. BACKGROUND

1. Duquesne Light is a public utility as that term is defined under Section 102 of the Public Utility Code, 66 Pa. C.S. § 102, certificated by the Commission to provide electric service in the City of Pittsburgh and in Allegheny and Beaver Counties in Pennsylvania. Duquesne Light is also an electric distribution company ("EDC") and a default service provider ("DSP") as those terms are defined under Section 2803 of the Public Utility Code. 66 Pa. C.S. § 2803. Duquesne Light provides electric distribution service to approximately 579,000 customers.

2. Duquesne Light's attorneys are:

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Duquesne Light's attorneys are authorized to receive all notices and communications regarding this proceeding.

3. On November 14, 2008, Act 129 of 2008, P.L. 1592 ("Act 129") became effective. Act 129 provides, among other things, that each Pennsylvania EDC with at least 100,000 customers is required to provide smart meter technology to customers in accordance with a schedule not to exceed 15 years. Act 129 defines smart meter technology as follows:

> (g) Definition. – As used in this section, the term "smart meter technology" means technology, including metering technology and network communications technology capable of bidirectional communication, that records electricity usage on at least an hourly basis, including related electric distribution system upgrades to enable the technology. The technology shall provide customers with direct access to and use of price and consumption information. The technology shall also:
>
> (1) Directly provide customers with information on their hourly consumption.
>
> (2) Enable time-of-use rates and real-time price programs.
>
> (3) Effectively support the automatic control of the customer's electricity consumption by one or more of the following as selected by the customer:
>
> (i) the customer;
>
> (ii) the customer's utility; or
>
> (iii) a third party engaged by the customer or the customer's utility.

66 Pa. C.S. § 2807(g).

4. The Commission adopted its *Smart Meter Implementation Order* on June 18, 2009, outlining its guidance for an EDC's Smart Meter Procurement and Installation program pursuant to Act 129. The *Implementation Order* established the standards that each plan must meet and provided guidance on the procedures to be followed for submittal, review and approval of all aspects of each smart meter plan. Additionally, in the Implementation Order, the Commission granted a 30-month grace period following plan approval for EDCs to assess needs,

select technology, secure vendors, train personnel, install and test support equipment and establish a detailed meter deployment schedule. *Implementation Order,* p. 9.

5. In the *Implementation Order*, the Commission established nine additional capabilities including:

- Ability to remotely disconnect and reconnect.
- Ability to provide 15-minute or shorter interval data to customers, EGSs, third-parties and an RTO on a daily basis, consistent with the data availability, transfer and security standards adopted by the RTO.
- On-board meter storage of meter data that complies with nationally recognized non-proprietary standards such as ANSI C12.19 and C12.22 tables.
- Open standards and protocols that comply with nationally recognized non-proprietary standards, such as IEEE 802.15.4.
- Ability to upgrade these minimum capabilities as technology advances and becomes economically feasible.
- Ability to monitor voltage at each meter and report data in a manner that allows an EDC to react to the information.
- Ability to remotely reprogram the meter.
- Ability to communicate outages and restorations.
- Ability to support net metering of customer-generators.

6. On August 14, 2009, Duquesne Light filed its Initial Smart Meter Plan with the Commission. In its Initial Smart Meter Plan, the Company, among other things: (1) provided a description of its current metering system, (2) explained how it would address customer requests for smart meters and installation of smart meters in new construction during the grace period, (3)

explained its network development and installation plan within the 30 month grace period, (4) proposed a milestone and status reporting schedule during the grace period, and (5) proposed a cost recovery mechanism for recovering smart meter costs.

7. On May 11, 2010, the Commission entered an Order approving Duquesne Light's Initial Smart Meter Plan, with certain modifications. In summary, the Commission approved Duquesne Light's proposal to recover its smart meter costs through a reconcilable cost recovery mechanism, and set forth the details of how this mechanism would work. The Commission approved the Company's milestone and status reporting schedule during the grace period. In addition, the Commission approved the Company's proposed smart meter implementation schedule, which the Company explained was subject to change.

8. On July 1, 2010, the Company filed a Cost Benefit Analysis for the additional smart meter capabilities identified in the Implementation Order. Therein, the Company provided a detailed evaluation of the costs to implement each of the nine additional smart meter capabilities identified in the Implementation Order, the potential benefits of implementing these additional capabilities and the Company's recommendations regarding whether it should be required to implement these additional capabilities.

9. On December 29, 2010, Duquesne Light filed its Application for Approval of Assessment of Needs, Technology Solutions and Vendor Selection ("Assessment Application"). In the Assessment Application, the Company provided a detailed assessment of its Advanced Meter Infrastructure ("AMI") technology requirements, possible solutions and selection of technologies and vendors. The Company explained that the scope of its work during the grace period was comprised of two major components. The first component involved Billing and Metering System Upgrades necessary to comply with smart meter requirements. The second

component involved Smart Meter Technology Infrastructure and specifically focused on the technical infrastructure, processes and systems required to support the roll out of smart meters. In summary, in the Assessment Application, Duquesne Light proposed to replace all of its existing Itron Advanced Meter Reading ("AMR") meters with new ITRON Smart Meters that would provide two-way communication between the meter and the Company and would comply with all requirements of Act 129 and the Commission's *Implementation Order*.

10. In the Assessment Application, the Company requested that the Commission issue an order approving: (1) the procedure used to evaluate and select a primary AMI vendor, (2) the Company's Assessment of Needs, (3) the Technology Section of RF mesh and associated findings, (4) the selection of the Company's Primary AMI vendor, (5) updated cost projections for the entire Smart Meter Project and Deployment, and (6) any other approvals that the Commission deemed to be necessary.

11. On January 31, 2011, the Company filed a Supplement to its Assessment Application. In the Supplement, Duquesne Light identified Itron, Inc. ("Itron") as its recommended primary contractor to design, construct, implement and oversee the Company's Smart Meter program. The Company explained that Itron scored highest on a technical evaluation of the bids and provided the lowest cost solution of the four bidders. In the Supplement, Duquesne Light requested Commission approval of the initial Assessment Application and Supplement. No party objected to the Company's Assessment Application or its Supplement. The Commission did not issue an Order with respect to the Company's Assessment Application or the Supplement thereto.

12. On March 31, 2011, the Company filed its Establishment of Network Design for the Duquesne Light Smart Meter Program ("Network Design") with the Commission. Therein,

the Company explained that it had conducted a study to review the Company's existing communication infrastructure, review network and communication infrastructure necessary for the AMI and also review available private and public written communications solutions. Specifically, the Company evaluated:

- Operating Frequencies Available in its Service Territory;
- Radio Technologies/Vendors;
- Solution Cost (up front and ongoing)
- Expected capacity, bandwidth, latency and reliability of each option;
- Security provisions (public versus private writers communications); and
- Advantages and disadvantages of available solutions.

13. The initial Network Design conclusions supported the use of private wireless options as the primary communication methodologies, with public wireless as a backup communication. The Company also noted that further analysis was necessary to finalize the Network Design Study conclusions and that the proposed design was subject to change based on further findings or in the event that other viable technologies would become available.

14. On June 30, 2011, the Company made an additional milestone filing related to design, testing and certification of Electronic Data Interchange ("EDI") transactions. In this filing, Duquesne Light explained that it would be able to provide customers with direct access to non-validated real time data directly from the smart meter through a residential customer's Home Area Network ("HAN")[2]. Validated hourly interval data would be provided through a secure web portal within 24 hours from the completion of the data upload for the entire population of Duquesne Light's smart meters to the MDM systems. Additionally, non-validated, real time data

[2] HAN is the communication pathway from the meter to a customer's in-home devices, such as smart thermostats, in-home displays and device control units that will support demand response programs.

would be provided to third parties through a secure, authenticated connection at the expense of the third party. Validated hourly interval data would be provided to third parties through a standard interface consistent with the North American Energy Standards Board within 24 hours of the completion of the data upload for the entire population of Duquesne Light's smart meters to the MDM systems. Finally, the Company would provide EDI access to smart meter data to authorized commercial operators, such as conservation service providers and electric generation suppliers ("EGS") using the 867 historical interval usage transaction.

15. On October 6, 2011, the Company filed an Installation, Testing and Rollout of Support Equipment and Software Update filing. The primary purpose of the October 6 update filing was to outline the equipment testing that the Company planned to conduct prior to deploying AMI meters across its service territory.

16. On November 2, 2011, the Company filed a status update related to its Establishment of Plans for Installation of Meters and Outside Communications and Training. Therein, the Company provided an overview of its smart meter deployment plan, a high level Smart Meter Program Schedule and Milestones, and an overview of its Staff Training Plan.

17. On November 18, 2011, the Company filed a status update with respect to its Smart Meter Plan and further requested a six month extension, from December 31, 2011 to June 30, 2012, to file the Company's Final Smart Meter Plan. With respect to the status update, the Company provided a summary of the work that it had done in the previous 18 months. In addition, the Company noted that there were several smart meter issues that it was still reviewing.

18. On December 13, 2011, the Commission issued a Secretarial Letter granting the Company's request for an extension, until June 30, 2012, to file its Final Smart Meter Plan.

19. Pursuant to the Commission's December 13, 2011 Secretarial Letter, Duquesne Light hereby files its Proposed Final Smart Meter Plan.

III. PROPOSED FINAL SMART METER PLAN

A. Summary of Changes Required To Implement Act 129's Smart Meter Requirements

20. Duquesne Light was one of the first EDCs to implement AMR technology for customers. Duquesne Light began installing ITRON AMR meters for customers in 1996.

21. Installing the AMR system provided many benefits for the Company and its customers, including but not limited to, improving operational efficiencies, eliminating the need for field visits for final bills, and improving the Company's actual meter read rate to 99.9%.

22. After Act 129 was enacted, the Company determined that its current AMR system would not meet the Act 129 Smart Meter requirements. Therefore, the Company began an in-depth, detailed process to evaluate the most cost-effective ways to meet the smart meter technology requirements of Act 129. After its initial evaluation, Duquesne Light determined that it would need to upgrade and/or replace its existing billing, metering and communication systems in order to fully meet the Act 129 requirements.

23. Duquesne Light's Smart Meter project has two main components: (1) the FOCUS Project and (2) the AMI project.

24. Under the FOCUS project, Duquesne Light is upgrading its existing billing systems and installing a Meter Data Management ("MDM") system to support smart meter requirements. The billing system must be upgraded in order to offer Time-of-Use ("TOU"), Real-Time ("RT") and Critical Peak Pricing ("CPP") pricing options as well as to handle the increased requirements for managing meter data. The Commission has approved Duquesne Light's request to implement the necessary Smart Meter components of the FOCUS project,

including replacing the Company's Customer Care and Billing ("CC&B") system, installing a MDM system, integrating the CC&B and MDM, and to make certain software purchases.[3] See Initial Smart Meter Technology Procurement and Installation Plan, pp. 20-25; *Petition of Duquesne Light Company for Approval of Smart Meter Technology Procurement and Installation Plan*, Docket No. M-2009-2123948, Order entered May 11, 2010.

25. Under the AMI Project, Duquesne Light will install: (1) a Head-end Data Collection System, (2) new ITRON Smart Meters that have Zigbee wireless technology, (3) a Local Area Network that allows smart meters to communicate with other meters and/or collection points throughout the service territory, and (4) a wide area network ("WAN") which is the communication pathway from the collectors/towers located throughout the service territory to the AMI head-end system located at the Company's offices. Under the AMI Project, Duquesne Light will also hire a Systems Integrator to integrate the MDM and Head-End collection systems as well as integrate all other components of the Smart Meter system.

B. Selection Of AMI Vendor And Technology

1. AMI Vendor

26. On January 31, 2011, the Company filed a Supplement to Application for Approval of Duquesne Light's Assessment of Needs, Technology Solutions and Vendor Selection at Docket No. M-2009-2123948. Therein, the Company explained that it had selected ITRON to be the primary contractor to design, construct, implement and oversee its Smart Meter Program.

27. Duquesne Light conducted a bid process to select its AMI vendor and received four bids. ITRON scored highest from a technical evaluation of the bids and proposals, and also

[3] There are certain elements of the FOCUS Project that are not related to the Smart Meter upgrades. The Company is not recovering the costs for these elements in its Smart Meter Charge.

provided the lowest cost solution of the four bidders. Duquesne Light also notes that ITRON installed the Company's current AMR system, and therefore, the Company has substantial experience in working with ITRON.

2. AMI Smart Meters

28. Based upon its extensive evaluation and bid process, Duquesne Light has elected to install ITRON Smart Meters for all customers. The ITRON Smart Meters include the latest technology, have two-way communication capability and have Zigbee[4] capability.

3. AMI Communication Network

29. Duquesne Light currently has an AMR system in its service territory. Under its current AMR system, the Company reads approximately 90% of its residential and very small C&I customers (< 50 kw) through radio communication towers. The remaining 10% of these customers' meters are read monthly through handheld or drive-by communication units. The larger C&I customers (above 50 kw) have Alpha meters and data is collected and processed through the MV-90 system. These meters are read on a daily basis via cellular or landline communication systems.

30. Duquesne Light's existing communication network will not support the smart meter technology requirements of Act 129, in large part because a significant part of the network does not have bi-directional communication capability.

31. In its Initial Smart Meter filing, the Company explained that it intended to conduct a thorough analysis of communications systems to determine the most cost-effective system that met the functionality required by the Company. The Company has conducted a

[4] Zigbee is a commonly used communication specification for advanced metering systems. Zigbee has the ability to link smart meters with devices such as thermostats, household appliances, HVAC and other equipment that uses electricity.

thorough analysis of communication and network issues. This analysis is described in more detail in Sections III(D) and III(E) of the Final Smart Meter Plan.

32. Based upon its analysis, Duquesne Light proposes to install a private communications network as part of its AMI system. The private communications solution will provide the Company with better security and system reliability than a public network. In addition, while the private network has more up-front costs, it also has considerable annual expense savings, as compared to a public network, which offsets the initial up-front costs over the life of the system.

C. AMI Deployment

33. In its Initial Smart Meter Filing, Duquesne Light noted that it was premature to develop a final system-wide deployment schedule given the substantial tasks that the Company was undertaking to: (1) assess needs, and (2) select technology, a vendor, software, hardware and other smart meter components. Therefore, the Company noted its intent to meet the 15 year deployment schedule set forth in the Commission's *Implementation Order*. See Duquesne Light Initial Smart Meter Plan, pp. 36-37. The Company did provide an initial estimated date of December 31, 2018 for full system roll out of smart meters. However, the Company explained that this date was not final and that the Company would provide a detailed description of its plans for full system-wide roll out of smart meter technology as part of its Final Smart Meter Plan Filing. See Duquesne Light Initial Smart Meter Plan, p. 37.

34. In the Commission's Order approving the Company's Smart Meter Plan, the Commission noted that Duquesne Light had provided an approximate date of December 31, 2018 to complete system-wide deployment of smart meters. The Commission further noted that Duquesne Light had explained that the dates were approximate and that it was the Company's intent to meet the 15 year deployment schedule provided by Act 129. *Petition of Duquesne Light*

Company for Approval of Smart Meter Technology Procurement and Installation Plan, Docket No. M-2009-2123948, Order entered May 11, 2010, p. 27.

35. The Company has further evaluated smart meter deployment issues and proposes to deploy smart meters to all customers over a 7 year schedule. Under this schedule, the Company will utilize a two-year ramp up period followed by full deployment over the next five years. The ramp up period will begin with a 5,000 smart meter roll-out in the latter half of 2014 followed by a gradual build up to a full deployment of 9,000 meters per month beginning at the end of 2015. The Company anticipates that it will complete full deployment of its smart meters by the end of 2020.

36. The ramp-up period will minimize the risk of unforeseen technology glitches which could have a negative impact on customers.

37. In addition, Duquesne Light proposes to phase-in smart meter functionalities over time, starting with the most basic capabilities such as monthly billing from smart meter usage data and ending with the most advanced capabilities such as support for HANs. A schedule showing the phase-in periods is shown in Section III(F) of the Final Smart Meter Plan.

38. The phase-in functional implementation approach is designed to allow the market for many of the advanced smart meter capabilities to become more mature as these functionalities become more developed over time.

D. Smart Meter Capabilities

39. In the Commission's *Implementation Order*, the Commission identified six minimum smart meter capabilities that are required by Act 129. *Implementation Order*, pp. 29-30. The Commission directed EDCs to quantify the costs to deploy and operate these six minimum capabilities in EDCs' Smart Meter Plans.

40. In addition, the Commission listed nine additional capabilities that EDCs were to evaluate. The Commission also directed EDCs to quantify the individual incremental costs for deploying these additional capabilities. The Commission further noted that it may waive these additional capabilities to the extent that an EDC or another party demonstrated that the additional capabilities were not cost-effective.

41. Duquesne Light addresses each of the minimum and additional capabilities set forth in the *Implementation Order* below. Cost details for these capabilities are provided in the Company's Smart Meter Plan.

1. Minimum Capabilities Under Act 129

a. Bidirectional Data Communication

42. Duquesne Light's AMI system will employ bidirectional data communication. Specifically, the ITRON Smart Meters will communicate usage information to Duquesne Light. In addition, Duquesne Light will be able to send signals to the ITRON Smart Meters to communicate with customers' HAN devices.

b. Recording Usage Data On At Least An Hourly Basis Once Per Day

43. The new AMI system will have the capability of recording usage data at 5, 10, 15, 30 or 60 minute intervals. The Company's AMI communication network will provide the capability to retrieve this data at least once per day for all meters.

c. Providing Customers With Direct Access To And Use Of Price And Consumption Information

44. The new AMI system will include ZigBee enabled smart meters that faciliate direct access from the meter to a customer's HAN device for price and consumption information. Duquesne Light will remotely provision and enable the direct access interface once the customer request for direct access has been authenticated. The customer will be responsible for

purchasing and installing their own HAN devices as well as establishing the network connection with the ZigBee interface.

d. Providing Customers With Information On Their Hourly Consumption

45. Duquesne Light will provide customers with validated hourly consumption information approximately 24 hours after the data has been collected from all meters (currently estimated to be 5 a.m. each day). Customers will be able to access this information through a secure web portal on the Company's web site. As noted above, customers will also be able to access usage information through HAN devices, if they elect to purchase such a device.

e. Enabling Time-of-Use ("TOU") Rates And Real-Time ("RT") Price Programs

46. The Company's AMI system will enable both TOU and RT price programs. The Company has implemented two residential pilot TOU programs in the summer of 2012. The Company intends to evaluate the results of these pilot programs and seek Commission approval of additional TOU pilot programs after its evaluation.

47. Duquesne Light's AMI will also support TOU and RT programs offered by EGSs. The Company will be able to provide hourly usage data to EGSs. In addition, the Company is in the process of implementing a "bill-ready" functionality which will allow EGSs to calculate a TOU customer's or RT rate customer's bill, and provide the total for the Company to bill to customers. The bill ready functionality will facilitate the support of EGS TOU and RT programs.

f. Supporting the Automatic Control Of A Customer's Electric Consumption

48. Duquesne Light's AMI communication network and Zigbee interface will be able to be used to control customers' electric consumption. Duquesne Light will allow third parties

access to the Company's system through a secure web portal. Upon the request of a customer, third parties will be able to control a customer's consumption through the Zigbee interface.

2. Additional Smart Meter Capabilities

a. Ability To Remotely Disconnect And Reconnect

49. The Company's AMI system will provide remote connect and disconnect capability. Remote disconnect and reconnect functionality allows utilities to turn off or turn on a customer's service at the meter without a physical visit to the premise. This capability is accomplished through additional hardware (a switch) integrated into the meter. This capability is only available for single-phase meters having a 240 volt service with a rating of 200 amps or less.

50. There is an additional cost of approximately $30 per meter to install the switch to enable the remote disconnect/reconnect functionality. In addition, the Company's FOCUS system would require upgrades costing approximately $500,000 to provide this functionality. The cost to install this functionality on a system wide basis would be approximately $17.5 million.

51. There are many benefits to implementing the remote disconnect and reconnect functionality. These benefits include improved safety, operational efficiencies, revenue collection, employee efficiencies and improved customer experiences. Duquesne Light believes that the benefits of this functionality support implementation.

b. Ability To Provide 15-Minute Or Shorter Internal Data

52. The Company's Smart Meters will be capable of recording data in 5 minute intervals at no incremental cost as compared to hourly intervals. However, the bandwidth of the AMI communication network as well as the storage capacity of the ITRON Collection Engine

and Oracle MDM system would have to be expanded at an incremental cost to accommodate more granular intervals than hourly.

53. Duquesne Light does not believe these incremental costs are justified at this time since there is no existing requirements for interval data more granular than hourly. However, since expansion of network bandwidth and storage capacity is scalable, the Company proposes implementing an AMI system based on hourly interval data and then expanding it later if future applications require more granular intervals.

c. On-Board Storage Of Meter Data That Complies With Nationally Recognized Non-Proprietary Standards Such As ANSI C12.19 and C12.22 Tables

54. The ANSI C12.19 standard provides a common data structure for use in transferring data to and from meters. The ANSI C12.22 standard defines how to transmit standardized tables of meter data across wired or wireless networks. This standard uses encryption to enable secure communications, protecting confidentiality and data integrity.

55. The Company's AMI System will comply with these standards without any additional implementation costs.

d. Open Standards And Protocols That Comply With Nationally Recognized Non-Proprietary Standards, Such As IEEE 802.15.4

56. IEEE 802.15.4 is a communication standard for low rate wireless personal networks such as Zigbee. Zigbee has the ability to link smart meters with devices such as thermostats, household appliances, HVAC, lighting systems and other household appliances or systems.

57. The Company's AMI system will comply with the IEEE 802.15.4 standard without any additional implementation costs.

e. Ability To Upgrade Minimum Capabilities As Technology Advances And Becomes Economically Feasible

58. The capability is whether existing equipment can adopt or be modified to incorporate new capabilities as technology advances. Duquesne Light cannot predict all future needs or technologies. However, the Company is implementing an AMI system that is flexible and expandable. Moreover, Duquesne Light will be able to upgrade the software for its AMI system, including meter software.

f. Ability To Monitor Voltage At Each Meter And Report Data In A Manner That Allows An EDC To React To The Information

59. The AMI system that Duquesne Light is implementing will provide the capability to monitor voltage at each meter. This monitoring can be accomplished by establishing a register within the Smart Meter for voltage related interval data or by programming the Smart Meter to send an alert if the voltage measurements are outside a normal range.

60. In order to report voltage data in a manner that allows Duquesne Light to react to the information, an interface must be developed between the AMI Head-End Collection system and the MDM system. In addition, new voltage reporting functionalities must also be developed. This interface and new reporting functionalities will be developed by one of Duquesne Light's AMI vendors. However, it is unclear at this time when these products will be developed or how much they will cost.

61. Duquesne Light anticipates that it will implement the voltage monitoring capability to supplement its existing power quantity systems once the interface and new reporting functionalities become available.

g. Ability To Remotely Reprogram The Meter

62. Firmware within the meter controls all of the advanced functions and capabilities of the meter. Firmware is the software that interfaces the meter's hardware and the network application, enabling the meter to perform its functions. The firmware in the Company's Smart Meters can be reprogrammed remotely through the communications network or at the meter.

63. There are no additional meter or network costs to be able to remotely program the Smart Meter's firmware.

h. Ability To Communicate Outages And Restorations

64. Duquesne Light's ITRON Smart Meters will have the capability to communicate outages and restorations at the meter. This communication is based on a "last gasp" alert that the meter sends when it loses power along with a subsequent "first gasp" alert when power is restored.

65. In order to fully utilize this capability, the Company would have to replace its current Outage Management System ("OMS") and also develop and maintain a distribution system "Electrical Model." Duquesne Light does not believe that these incremental costs are justified at this time and are not justified by any incremental improvements in outage detection.

66. However, Duquesne Light does intend to implement this functionality on a limited basis in order to communicate outages and restorations from the Smart Meters to the Head-End Collection system into an AMI data warehouse on a near real-time basis. The data warehouse will include reporting functionality that will provide the Company with the following data:

- Number of customers that are out of power at any given time during an outage event.
- A list of customers that have been restored at any given time during an outage event.

- The length of time between when a customer lost power and when that customer's power was restored.

67. This reporting functionality in the AMI data warehouse will replace and improve the accuracy of all of the information that the Company's Operations Center currently receives from its existing AMR system. This initiative is estimated to cost $250,000.

i. Ability To Support Net Metering Of Customer Generators

68. Duquesne Light's Smart Meters will support net metering of customer generators. The ITRON Smart Meters will have multiple channels that will allow the Company to measure both the excess energy that is being generated by the customer and also measure energy that is delivered by the Company to the customer. The ITRON Smart Meters come equipped with this capability, and therefore, there are no additional costs to implement this capability.

E. Smart Meter Costs

1. Smart Meter Budget

69. The total cost of Duquesne Light's Smart Meter Program is estimated to be $238 million. This includes the $38 million that Duquesne Light will have spent during the Grace Period. A high level overview of the estimated spending for the various components of the Smart Meter Program is provided in the table below:

Cost Estimates ($ millions)	Total
Smart Meter Program Planning	3.0
FOCUS Project	35.0
AMI Project Vendor Components (ITRON)	97.5
AMI Project Communication Network (WAN)	8.0
AMI Project IT Systems including PMO	63.4
AMI Project Customer Acceptance	3.1
AMI Project Contingency	28.0
Total	$238.0

A further breakdown of the estimated project costs is provided in Attachment H to the Final Smart Meter Plan. The post Grace Period estimates set forth in the Plan are based on current technology assumptions that will most certainly change over time. Because these are estimates, and subject to change, Duquesne Light reserves the right to petition for modification of these costs.

2. Smart Meter Cost Recovery

70. The Commission addressed smart meter cost recovery issues in its May 11, 2010 Order approving the Company's Initial Smart Meter Plan.

71. The Company proposes to continue to recover its smart meter costs under the Smart Meter Charge Rider approved by the Commission, as set forth in the May 11, 2010 order

and as implemented by the Company. Additional details are provided in the Final Smart Meter Plan and in the testimony of the Company's witness, Mr. Pfrommer.

F. Post Grace Period Deployment For New Construction And Customer Requests.

1. New Construction

72. In its *Implementation Order*, the Commission directed EDCs to install smart meters in new construction after the grace period. *Implementation Order*, p. 12.

73. At the end of the grace period, Duquesne Light will install smart meters at all new construction sites and will read through its existing AMR communication network. Smart Meters read through the AMR communication network will provide daily reads until they are transitioned to the AMI communication system.

74. These Smart Meters will be transitioned to the new AMI communication network when the network is extended to these locations. After the transition, the Smart Meters will provide hourly reads.

2. Customer Request

75. In the Smart Meter *Implementation Order*, the Commission also directed EDCs to provide smart meters to customers upon request. *Implementation Order*, p. 9. The Commission noted that deployment of smart meters on an individual basis could result in greater costs than a systematic system-wide deployment. Therefore, the Commission concluded that EDCs could charge customers that request Smart Meters outside of the Company's deployment schedule the incremental installation costs.

76. Consistent with the Commission's *Implementation Order*, the Company will honor customers' requests for Smart Meters outside of the deployment schedule. Duquesne

Light will charge the requesting customer for any incremental costs due to such request. The Company will develop a fee for this service and update Rule 14.2 of its tariff accordingly.

77. If a customer requests a smart meter, Duquesne Light will install an ITRON Smart Meter and read the meter through the Company's existing AMR network for customers that request direct access to real time, unvalidated usage data. In addition, Duquesne Light will install Alpha Meters (currently used on C&I accounts) for customers that request next day access to validated hourly usage data.

78. After this Final Plan is approved, Duquesne Light will purchase, implement and integrate the ITRON Collection Engine with the Oracle MDM System. Once this work is complete, Duquesne Light will install ITRON Smart Meters for all customer requests and will read them via a public cellular network.

G. Customer Education And Outreach

79. Duquesne Light believes that Customer Education and Outreach are critical for customer acceptance and utilization of smart meter technology.

80. Duquesne Light has developed a comprehensive Customer Education and Acceptance strategy which is explained in greater detail in Section III(I) of the Plan and in the testimony of Peter Honebein.

81. Duquesne Light proposes to implement a 90-60-30 day communication strategy that provides different levels of communications to customers, employees and community and other stakeholders 90 days, 60 days and 30 days before meters are installed in a specific community or location. The strategy has been used successfully by other utilities across the country.

82. In addition, Duquesne Light will measure the success of its customer education strategy through focus group tests, surveys and analysis of customer calls.

IV. CONCLUSION

WHEREFORE, for all of the foregoing reasons, Duquesne Light Company has spent considerable time and effort in evaluating and proposing a cost-effective Smart Meter Plan that will provide customers with the Smart Meter functionalities required under Act 129 and those additional capabilities set forth in the Commission's Smart Meter Implementation that are cost-effective. Duquesne Light Company respectfully requests that the Pennsylvania Public Utility Commission:

(1) Approve this Petition;

(2) Approve the Company's Smart Meter Plan without modification;

(3) Find that the Final Smart Meter Plan fully complies with Act 129 and the Commission's *Implementation Order*; and

(4) Grant any waivers that may be necessary, if any, for Duquesne Light to implement its Final Smart Meter Plan, as filed.

Respectfully Submitted,

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Date: June 29, 2012

Attorneys for Duquesne Light Company

VERIFICATION

I, David G. Wolfe, being the Director of Technology at Duquesne Light Company, hereby state that the facts above set forth are true and correct to the best of my knowledge, information and belief and that I expect that Duquesne Light Company will be able to prove the same at a hearing held in this matter. I understand that the statements herein are made subject to the penalties of 18 Pa.C.S. § 4904 relating to unsworn falsification to authorities.

Date: 6-29-2012

David G Wolfe
David G. Wolfe

TAB
1

Duquesne Light Statement No. 1

BEFORE THE
PENNSYLVANIA PUBLIC UTILITY COMMISSION

PETITION OF DUQUESNE LIGHT COMPANY
FOR APPROVAL OF ITS FINAL SMART METER TECHNOLOGY PROCUREMENT
AND INSTALLATION PLAN

Docket Nos. P-2012-_____ and M-2009-2123948

Direct Testimony

Witness: David Wolfe

Subject: Overview of Smart Meter Plan and Technology Solutions and Deployment Schedule.

Direct Testimony of David Wolfe

I. INTRODUCTION

Q. Please state your full name and business address.

A. My name is David Wolfe. My business address is 411 7th Avenue, Pittsburgh, PA 15219.

Q. By whom are you employed and in what capacity?

A. I am Director of Technology for Duquesne Light Company ("Duquesne Light" or "Company").

Q. What are your qualifications, work experience and educational background?

A. I have more than 26 years of diversified experience in technology, including 19 years in various staff and leadership positions at Duquesne Light. I began my employment with Duquesne Light on June 3, 1993. In my current role as Director of Technology, I am responsible for IT applications, projects, infrastructure and support, telecommunications, and the company's Smart Meter Program. I also serve as a director on the Utility Telecom Council's Smart Network's board. I have a master's degree from Duquesne University and a bachelor's degree from Grove City College in Computer Systems and Accounting.

Q. What is the purpose of your testimony?

A. The purpose of my testimony is two-fold. First, I will provide an overview of electric distribution company ("EDC") smart meter technology requirements

under Act 129 of 2008 ("Act 129") and the Commission's Smart Meter Implementation Order, *Smart Meter Procurement and Installation*, Docket No. M-2009-2092655, *Implementation Order* entered June 24, 2009 ("*Implementation Order*"). Second, I will provide an overview of Duquesne Light's Final Smart Meter Procurement and Implementation Plan ("Final Smart Meter Plan"). Additional details are provided in the Final Smart Meter Plan itself.

Q. **Are you sponsoring any exhibits?**

A. Yes. A copy of Duquesne Light's Final Smart Meter Plan is attached as Exhibit 1.

Q. **Please provide a brief overview of Duquesne Light's Final Smart Meter Procurement and Implementation Plan (Final Smart Meter Plan").**

A. Duquesne Light's Final Smart Meter Plan is a measured approach to deploying smart meter technology. To deploy fully functional "*smart meters*" Duquesne Light must build the infrastructure required to enable the meter functionality. The Company's current system infrastructure and customer information ("CIS") system will not support the capabilities mandated by Act 129 and the *Implementation Order*. Therefore, the Company is replacing its current CIS with a Customer Care & Billing System ("CC&B") and is implementing a new Meter Data Management ("MDM") System. Throughout my testimony, the replacement of these systems is referred to as the FOCUS ("**F**or **O**ur **Cus**tomers") project.

Duquesne must also replace its existing Advanced Meter Reading ("AMR") system with an Advanced Metering Infrastructure ("AMI") system.

Duquesne Light's AMI system is comprised of four (4) individual components: smart meters; Mesh Network or Local Area Network ("LAN"); Wide Area Network ("WAN"); and the Head-End Data Collection Engine. These systems function independently and together to transmit data from smart meters to Duquesne Light's back office, and are required to provide smart meter technology to customers. After the systems infrastructure is built, Duquesne Light will begin to integrate these systems. Once the systems are fully integrated, smart meters will provide the fifteen capabilities required by Act 129 and the Commission's *Implementation Order.*

In the fourth quarter of 2012, Duquesne Light will begin to install smart meters in all new construction and upon customer request. Full deployment will occur over a seven (7) year timeframe beginning with a two-year ramp up period in 2014 - 2015 followed by full scale deployment of approximately 9,000 meters per month beginning thereafter and concluding in 2020. Concurrent with the meter deployment, meter functionality will be phased in beginning with basic capabilities and gradually implementing newer, more complex technology with full functionality for installed meters achieved in 2017.

The total estimated cost of the Final Smart Meter Plan is $238,000,000, which includes $35,000,000 for the FOCUS project, and $203,000,000 for the AMI project.

II. Background

Q. **Does Act 129 provide guidance on the requirements of smart meter technology?**

A. Yes. Act 129 of 2008 ("Act 129" or the "Act") requires electric distribution company's ("EDCs") with more than 100,000 customers, including Duquesne Light, to implement smart meter technology within fifteen (15) years or by 2023. Act 129 defines "smart meter technology" as technology that:

- Is capable of bidirectional data communication;
- Records electric usage at least hourly;
- Provides customers with direct access to consumption and pricing information;
- Supports automatic load control by the EDC, customer or third parties with customer consent;
- Enables time-of-use ("TOU") and real-time pricing ("RTP") programs.

66 Pa.C.S.§2807(g).

Q. **Has the Commission provided additional guidance regarding smart meter technology?**

A. Yes. On June 24, 2009, the Commission issued its *Implementation Order*. The Order sets forth the standards that EDCs must meet for providing smart meter technology. The Order also directed EDCs to file a smart meter plan for Commission approval that included a summary of current smart meter technology deployment and a plan for future deployment with milestones and measurable

goals. The Order further directed that each EDC file smart meter plan that included an analysis of incremental costs for implementing nine (9) additional capabilities. The nine capabilities include:

- Remote disconnect and reconnect;
- The ability to 15 minute or shorter interval data to customers, EGSs, third parties and regional transmission organizations ("RTOs") on daily basis;
- On-board meter storage consistent with national non-proprietary standards;
- Open standards protocol consistent with national non-proprietary standards;
- The ability to upgrade minimum capabilities as technology advances and becomes economically feasible;
- Ability to monitor voltage at each meter and report data in a manner that allows an EDC to react to the information;
- Remote programming capability;
- Ability to communicate outages and restorations;
- Ability to support net metering of customer generators.

The Order also established a 30-month grace period for each EDC to assess its needs, select technology, secure vendors, train personnel, install and test support equipment and establish a detailed meter deployment schedule consistent with the statutory requirements.

Q. What work did Duquesne Light perform during the 30 month grace period?

A. Duquesne Light's Final Smart Meter Plan is based upon the extensive assessment that the Company is conducting during the 30 month grace period. This work is summarized below and is described in more detail in Section II of the Plan.

In accordance with the Commission's May 11, 2010 Opinion and Order approving Duquesne's Lights Initial Smart Meter Procurement and Installation Plan ("Initial Smart Meter Plan"), the Company made several milestone filing providing updates and requesting certain approvals from the Commission as it completed its due diligence during the grace period.

On July 1, 2010, the Company filed a Cost Benefit Analysis for the additional smart meter capabilities identified in the *Implementation Order*. This filing provided the Company's then-current incremental cost analysis for additional functionalities included in the *Implementation Order*. As discussed more fully below, the Company proposes to implement each of the required capabilities of Act 129 and the *Implementation Order* in some capacity.

On December 29, 2010, Duquesne Light filed its Application for Approval of Assessment of Needs, Technology Solutions and Vendor Selection ("Assessment Application"). In the Assessment Application, the Company explained the systems features and functionality required to meet the requirements of Act 129 and the *Implementation Order*. Duquesne Light explained that it conducted a competitive request for proposal ("RFP") procurement and vendor evaluation process to select an AMI vendor.

On January 31, 2011, the Company filed a Supplement to its Assessment Application. Therein, Duquesne Light recommended Itron, Inc. ("Itron") as its

contractor to design, build, and implement the Smart Meter program. Itron was selected because it received the highest scores on the technical evaluation of the bids, and provided the lowest cost of the bidders.

On March 31, 2011, the Company filed its Establishment of Network Design for the Duquesne Light Smart Meter Program ("Network Design"). Duquesne Light conducted a study to review its existing communication infrastructure and network to determine the infrastructure required to implement the AMI system. Through this process, the Company evaluated the available operating frequencies; radio technology and vendors; solution cost; capacity, bandwidth, latency and the reliability of each option; security issues attendant with public verses private communications and the advantages and disadvantages of the available solutions.

The initial Network Design supported the use of private wireless options as the primary communication methodologies, with public wireless as a backup communication. The Company noted that further analysis was necessary to finalize the Network Design Study conclusions. As discussed more fully below, Duquesne Light will use a private wireless solution as it provides for more control over security and reliability as well as greater opportunities to leverage available bandwidth.

On June 30, 2011, the Company filed an additional update related to design, testing and certification of Electronic Data Interchange ("EDI") transactions. In this filing, Duquesne Light explained that it would provide customers with direct access to non-validated real time data directly from the

smart meter through the customer's Home Area Network (HAN). Validated hourly interval data would be provided through a secure web portal within 24 hours from the completion of the data upload for the entire population of Duquesne Light's smart meters to the MDM systems. Additionally, non-validated, real time data would be provided to third parties through a secure, authenticated connection at the expense of the third party. Validated hourly interval data would be provided to third parties through a standard interface consistent with the North American Energy Standards Board within 24 hours of the completion of the data upload for the entire population of Duquesne smart meters to the MDM systems. Finally, the Company will provide EDI access to smart meter data to authorized commercial operators, such as conservation service providers and electric generation suppliers ("EGS") using the 867 historical interval usage transaction.

On October 6, 2011, the Company filed an Installation, Testing and Rollout of Support Equipment and Software Update filing. Therein, the Company outlined the equipment testing that it planned to conduct prior to deploying AMI meters.

On November 2, 2011, the Company filed its Establishment of Plans for Installation of Meters and Outside Communications and Training filing. In this filing the Company provided an overview of its smart meter deployment plan, Program Schedule and Milestones, and an overview of its Staff Training Plan.

Finally, on November 18, 2011, the Company filed a status update regarding its Smart Meter Plan and requested a six month extension, from December 31, 2011 to June 30, 2012, to file its Final Smart Meter Plan.

III. Duquesne Light's Final Smart Meter Plan

Q. Please describe the FOCUS project.

A. Under the FOCUS project, Duquesne Light is replacing its existing CIS and implementing a new MDM system to support smart meter requirements. The Company's current CIS must be replaced for the Company to offer TOU, RT and Critical Peak Pricing ("CPP") pricing options as well as address other smart meter requirements within Act 129 and the *Implementation Order*. Also, all of the Company's meter data is currently stored in Duquesne's CIS. However, smart meter technology will increase the data flowing to the Company beyond the current systems abilities. The Commission previously approved Duquesne Light's implementation of the Smart Meter Program components of the FOCUS project, which includes replacing the CC&B system, implementing a new MDM system, systems integration work and purchasing certain software as a part of the Company's Initial Smart Meter Plan. The Focus project is scheduled to be complete by the end of the second quarter of 2013. Additional details regarding the FOCUS project are provided in Section III(B) of the Final Smart Meter Plan.

Q. Please describe the AMI Project.

A. As a preliminary matter, Duquesne Light undertook a thorough evaluation of its existing systems to analyze its technology needs to meet the requirement of Act 129 and the *Implementation Order*. To complete this process, Duquesne Light engaged the subject matter expertise of SAIC, Inc. ("SAIC") (formerly R.W. Beck), which served as the Company's AMI advisor. At the conclusion of this process, the Company had a comprehensive understanding of the requirements for AMI technology. The Company implemented a competitive RFP process to select the AMI vendor best able to meet the Company's needs. A short list of two AMI vendors were identified purely based on technical merit. Ultimately, the Itron Open Way solution was selected as the most cost-effective AMI system for Duquesne's needs.

Duquesne Light's new AMI system will include four individual components: 1) smart meters; 2) Mesh Network or Local Area Network ("LAN"); 3) Wide Area Network ("WAN"); and 4) the Head-End Data Collection Engine. These systems function independently and together to transmit data from smart meters installed at the customer's premise to Duquesne Light's back office, and are required to provide fully functional smart meter technology.

Q. Please provide additional details regarding these four components.

A. Duquesne Light will install Itron smart meters for all customers. The Itron smart meters will meet all of the six minimum requirements of Act 129 as previously

identified, as well as the nine additional smart meter requirements provided in the *Implementation Order.*

The LAN transmits data between the Itron smart meters and ITRON cell relays within the OpenWay solution.

The WAN provides data communication between the ITRON cell relays within the LAN and the Head-End Data Collection Engine. Duquesne's Final Smart Meter plan includes a private radio solution for the intermediate portion of the WAN which connects the cell relays to Duquesne Light owned communication towers. Duquesne also proposes to leverage existing private fiber leased by Duquesne Light from DQE Communication for the back-haul portion of the WAN which connect the communication towers to Duquesne Light's data center where the Head-End Collection Engine is hosted. As explained in Section III(C) of the Final Smart Meter Plan, Duquesne Light has conducted an analysis on whether to implement a private or public WAN. Both the private and public alternatives have similar costs over the life of the AMI system. However, the private alternative provides more control over reliability and security that the public alternative. Therefore, Duquesne Light has chosen to implement a private solution for the WAN component of its AMI system.

Finally, the Head-End Collection Engine performs network management and coordinates data and collection operations.

Additional details regarding these four components are provided in the Final Smart Meter Plan.

Q. How will these systems be integrated to work together?

A. After the AMI infrastructure is built, Duquesne Light will begin to integrate the AMI system components with each other, and then ultimately with the Company's back-office systems. As explained in Section III(D) of the Final Smart Meter Plan, Duquesne Light intends to hire a systems integrator to manage all of the IT system activities including the integration of all of the Smart Meter Program components. Once these components are fully integrated, the systems within Duquesne Light's Smart Meter Program will provide the fifteen capabilities required by Act 129 and the Implementation Order.

Q. Will the Focus and AMI projects provide the fifteen smart meter capabilities mandated by Act 129 and the Implementation Order?

A. Act 129 requires EDCs' Smart Meter Systems to meet 6 minimum capabilities which include: (1) bidirectional data communications, (2) recording usage on at least an hourly basis once per day; (3) providing customers with direct access to and use of price and consumption information, (4) providing customers with information for their hourly consumption, (5) enabling TOU and RTP programs, and (6) supporting the automatic control of a customer's electric consumption. As explained in more detail in Section III(E) of the Final Smart Meter Plan, Duquesne Light's proposed AMI system will met all of the 6 minimum functionality requirements required under Act 129.

In addition, the Commission's *Implementation Order* lists 9 additional capabilities. EDCs are to identify and justify any incremental costs incurred to

implement these additional capababilities. Duquesne Light is proposing to implement all of the nine additional capabilities set forth in the Implementation Order in some capacity. Many of the additional capabilities can be implemented with no or very minimal incremental costs. Other capabilities do require incremental costs for implementation. However, Duquesne Light believes the incremental costs for the proposed solutions for addressing these capabilities in some capacity are justified. Additional details are provided in Section III(E) of the Final Smart Meter Plan.

IV. Smart Meter Technology Deployment

Q. Please describe the Company's smart meter technology deployment schedule.

A. To mitigate risk of technology glitches and to facilitate customer acceptance of smart meter technology, the Company proposes a measured deployment schedule. As detailed in our Final Smart Meter Plan, meter deployment will begin in 2014 with a 5,000 meter acceptance roll-out. The Company will gradually build up to full scale deployment of 9,000 meters per month by the end of 2015. Smart meter deployment will be complete by the end of 2020, three years ahead of the statutory deadline.

The Company intends to install smart meters while concurrently phasing in the capabilities required by Act 129 and the *Implementation Order*. Phased in meter functionality will begin with the most basic capabilities such as billing, and gradually progress to the most advanced capability such as support for automated control of customer's electric consumption. This phased in functionality

approach will permit the market to mature so that products and services are more advanced which will mitigate the risk of installing solutions that become technically obsolete. Under the proposed Final Smart Meter Plan, all capabilities will be enabled for installed meters by the end of 2017.

Q. **How will the Company implement smart meter technology in new construction?**

A. After the grace period, the Company will install ITRON smart meters at all new residential construction sites and communicate with these meters through its existing AMR ITRON Fixed Network system. These meters will be transitioned to the new AMI system at the time that the new communication network is extended to these locations as part of the full deployment schedule.

V. Smart Meter Costs

Q. Have you identified all of the estimated costs associated with the Company's Final Smart Meter Plan?

A. Yes. Duquesne Light projects that the total cost of implementing the Company's Final Plan will be approximately $238 million, which includes approximately $38 million of spending during the Grace Period. A chart showing the Company's estimated Smart Meter Program spending is below:

Cost Estimates ($ millions)	Total
Smart Meter Program Planning	3.0
FOCUS Project	35.0
AMI Project Vendor Components (ITRON)	97.5
AMI Project Communication Network (WAN)	8.0
AMI Project IT Systems including PMO	63.4
AMI Project Customer Acceptance	3.1
AMI Project Contingency	28.0
Total	$238.0

In addition to the Grace Period spending, the Company estimates that it will spend an additional $200 million to implement AMI project. Additional details regarding the Company's Smart Meter Program budget is provided in Section III(G) of the Final Smart Meter Plan.

VI. Risk Mitigation

Q. Has the Company adopted any risk mitigation strategies associated with developing and implementing its Final Smart Meter Plan?

A. Yes. The Company has adopted multiple risk mitigation strategies including: (1) engaging industry subject matter expertise throughout its planning effort. (2)

conducting a Proof of Concept to test the various components of the AMI system, (3) instituting a ramp-up period along with a phase-in of functionalities, (4) development of a Customer Education and Acceptance strategy, and (5) hiring a systems integrator to integrate systems components. Additional details regarding these actions are provided in Section J of the Final Smart Meter Plan.

Q. Does that conclude your testimony?

A. Yes.

TAB
1

BEFORE THE
PENNSYLVANIA PUBLIC UTILITY COMMISSION

DUQUESNE LIGHT COMPANY
FINAL SMART METER TECHNOLOGY
PROCUREMENT AND INSTALLATION PLAN

Docket Nos. P-2012-_____
M-2009-2123948

Date: June 29, 2012

TABLE OF CONTENTS

I. EXECUTIVE SUMMARY

Duquesne Light Company ("Duquesne Light" or the "Company") filed its Initial Smart Meter Procurement and Installation Plan ("Initial Smart Meter Plan") with the Pennsylvania Public Utility Commission ("Commission") on August 14, 2009. As part of the Initial filing, Duquesne Light received Commission approval to upgrade its customer information system and install a meter data management system. This project is known as the FOCUS Project. The new and replacement systems under the FOCUS Project are necessary in order for Duquesne Light to provide smart meter technology to customers. In addition, Duquesne Light received Commission approval to further develop a Final Smart Meter Procurement and Installation Plan to be filed with the Commission by December 31, 2011 ("Final Smart Meter Plan" or "Plan"). This date was subsequently extended to June 30, 2012 upon the request of the Company.

This filing constitutes Duquesne Light's Final Smart Meter Plan. Below, Duquesne Light has:

(1) Explained the steps that it has taken to develop this Plan during the Grace Period;

(2) Provided an overview of the FOCUS Project;

(3) Explained the Company's Advanced Metering Infrastructure ("AMI") Project which includes smart meters, the Local Area Network ("LAN"), the Wide Area Network ("WAN") and the Head End Collection Engine;

(4) Explained its plans for IT systems;

(5) Described the AMI system capabilities;

(6) Explained its proposed deployment schedule;

(7) Summarized the Smart Meter Program costs and cost recovery mechanism;

(8) Explained the Company's Customer Education and Acceptance Strategy; and

(9) Explained the Company's Risk Mitigation Strategies.

As explained herein, Duquesne Light's Final Smart Meter Plan will meet all of the requirements of Act 129, the additional requirements set forth in the *Implementation Order* and provides smart meter technology to customers in a cost-effective manner. *Smart Meter Procurement and Installation*, Docket No. M-2009-2092655, *Implementation Order* entered June 24, 2009 ("*Implementation Order*").

Under Duquesne Light's Final Smart Meter Plan, Duquesne Light proposes to install Itron Smart Meters for all customers. The Itron Smart Meters will be connected by a Local Area Network ("LAN") that collects data from the meters and transmits it through a Wide Area Network ("WAN") to a Head End Data Collection Engine. These four components will constitute Duquesne Light's Advanced Metering Infrastructure ("AMI") system. As explained herein, Duquesne Light's AMI system will provide a technology architecture that enables the six minimum capabilities of Act 129 and the nine additional capabilities identified by the Commission in its Smart Meter Implementation Order.

Duquesne Light proposes to deploy Smart Meters to customers over a seven-year period. This includes a two-year ramp up period to allow time for the Company to test its AMI system, followed by a deployment schedule of 9,000 meters per month, with full deployment of smart meters across the Company's service territory by 2020, three years ahead of the statutory time period under Act 129. In addition, Duquesne Light proposes to phase-in meter functionalities from 2013-2017. The phase-in approach will allow the market for many of the advanced smart meter capabilities to become more mature over time.

Duquesne Light estimates that the total cost of its Smart Meter Program will be approximately $238 million. This includes costs for both the FOCUS and AMI projects within the Smart Meter Program. In its Initial Smart Meter Filing, Duquesne Light estimated that its Smart Meter Program could cost between $152 million and $262 million to implement. Duquesne Light's current estimate of its Smart Meter Program cost is within the range originally identified by the Company and is $24 million lower than the high end of its original estimate.

In the Company's Initial Smart Meter filing, the Commission approved, with certain modifications, Duquesne Light's request to recover its smart meter costs through a fully

recoverable Smart Meter Charge ("SMC"). In this proceeding, Duquesne Light is proposing to continue to recover its smart meter costs through its Commission-approved SMC.

In addition, Duquesne Light is proposing a detailed, comprehensive Customer Education and Acceptance ("CEA") strategy to educate customers, stakeholder groups and employees about the Company's Smart Meter Program and its benefits. Duquesne Light is basing its CEA strategy on successful programs used by other utilities across the country. Duquesne Light believes that its CEA strategy is a vital component of its Final Smart Meter Plan.

As with all large, multi-year, multi-million dollar technology projects, the Company recognizes the multitude of risks inherent in a Smart Meter Program of this magnitude. Therefore, Duquesne Light has developed a broad set of risk mitigation strategies to minimize any potential negative impact of these risks on the program.

II. BACKGROUND

Duquesne Light is a public utility as that term is defined under Section 102 of the Public Utility Code, 66 Pa. C.S. § 102, certificated by the Commission to provide electric service in the City of Pittsburgh and in Allegheny and Beaver Counties in Pennsylvania.

On October 15, 2008, Governor Rendell signed into law Act 129 of 2008, which took effect on November 14, 2008 and, *inter alia*, mandated a smart meter procurement and installation program. *See* 66 Pa. C.S. § 2807(f), et seq. ("Act 129"). Act 129 provides, among other things, that each Pennsylvania EDC with at least 100,000 customers is required to provide smart meter technology to customers in accordance with a schedule not to exceed 15 years. Act 129 defines smart meter technology as follows:

> (g) Definition. – As used in this section, the term "smart meter technology" means technology, including metering technology and network communications technology capable of bidirectional communication, that records electricity usage on at least an hourly basis, including related electric distribution system upgrades to enable the technology. The technology shall provide customers with direct access to and use of price and consumption information. The technology shall also:
>
> (1) Directly provide customers with information on their hourly consumption.
>
> (2) Enable time-of-use rates and real-time price programs.
>
> (3) Effectively support the automatic control of the customer's electricity consumption by one or more of the following as selected by the customer:
>
> (i) the customer;
>
> (ii) the customer's utility; or
>
> (iii) a third party engaged by the customer or the customer's utility.

66 Pa. C.S. § 2807(g).

The Commission adopted its *Smart Meter Implementation Order* on June 18, 2009, outlining its guidance for an EDC's Smart Meter Procurement and Installation program pursuant to Act 129. The *Implementation Order* established the standards that each plan must meet and provided guidance on the procedures to be followed for submittal, review and approval of all aspects of each smart meter plan. Additionally, upon the recognition that it will take time to fully develop and install the entire smart meter network, the Commission granted a grace period of 30 months following plan approval ("Grace Period") for EDCs to assess needs, select technology, secure vendors, train personnel, install and test support equipment and establish a detailed meter deployment schedule.

In the *Implementation Order*, the Commission identified six minimum functionalities that EDC smart meter systems must provide under Act 129. These six minimum functionalities are:

1. Bidirectional data communications.
2. Reading usage data on at least an hourly basis once per day.
3. Providing customers with direct access to and use of price and consumption information.
4. Providing customers with information on their hourly consumption.
5. Enabling time-of-use ("TOU") rates and real-time price options.
6. Supporting the automatic control of the customers' electric consumption.

Implementation Order, pp. 29-30.

In addition, the Commission stated that each Plan filing should include an analysis of the individual incremental costs for deploying and operating the following nine additional smart meter technology capabilities:

1. Ability to remotely disconnect and reconnect.
2. Ability to provide 15-minute or shorter interval data to customers, EGSs, third-parties and an RTO on a daily basis, consistent with the data availability, transfer and security standards adopted by the RTO.
3. On-board meter storage of meter data that complies with nationally recognized non-proprietary standards such as ANSI C12.19 and C12.22 tables.

4. Open standards and protocols that comply with nationally recognized non-proprietary standards, such as IEEE 802.15.4.

5. Ability to upgrade these minimum capabilities as technology advances and becomes economically feasible.

6. Ability to monitor voltage at each meter and report data in a manner that allows an EDC to react to the information.

7. Ability to remotely reprogram the meter.

8. Ability to communicate outages and restorations.

9. Ability to support net metering of customer-generators.

Implementation Order, p. 30.

In the *Implementation Order*, the Commission further noted that it may waive the additional requirements for an EDC if the requirements are not cost-effective.

On August 14, 2009, Duquesne Light filed its Initial Smart Meter Plan with the Commission. In its Initial Smart Meter Plan, the Company, among other things: (1) provided a description of its current metering system, (2) explained how it would address customer requests for smart meters and installation of smart meters in new construction during the grace period, (3) explained its approach for developing a Final Smart Meter Plan within the 30 month grade period, (4) proposed a milestone and status reporting schedule during the grace period, (5) provided an estimated budget for grace period budget, and (6) proposed a cost recovery mechanism for recovering smart meter costs.

On May 11, 2010, the Commission approved Duquesne Light's Initial Smart Meter Plan, with certain modifications. *Petition of Duquesne Light Company for Approval of Smart Meter Technology Procurement and Installation Plan*, Docket No. M-2009-2123948. In summary, the Commission approved Duquesne Light's proposal to recover its smart meter costs through a reconcilable cost recovery mechanism, and set forth the details of how this mechanism would work. In addition, the Commission approved the Company's proposed smart meter implementation schedule, which the Company explained was subject to change. The

Commission also approved the Company's proposed milestone filing dates, and the Company's proposal to file a Final Smart Meter Plan by December 31, 2011.

On July 1, 2010, the Company filed a Cost Benefit Analysis for the additional smart meter capabilities identified in the *Implementation Order*. Therein, the Company provided a detailed evaluation of the costs to implement each of the nine additional smart meter capabilities identified in the *Implementation Order*, the potential benefits of implementing these additional capabilities and the Company's recommendations regarding whether it should be required to implement these additional capabilities. In the July 1, 2010 filing, Duquesne Light explained that its cost-benefit analysis was a preliminary analysis based upon information that was available at the time. Duquesne Light requested that the Commission defer ruling on whether Duquesne Light should implement the additional smart meter capabilities at that time. Duquesne Light further explained that it would have a better estimate of its smart meter costs at a later time and that the Company would provide a refined project budget and cost estimates in its Final Smart Meter Plan filing.

On December 29, 2010, Duquesne Light filed its Application for Approval of Assessment of Needs, Technology Solutions and Vendor Selection ("Assessment Application"). In summary, in the Assessment Application, Duquesne Light proposed to replace its existing Automated Meter Reading ("AMR") system with a new AMI system that would provide two-way communication between the meter and the Company and would comply with all requirements of Act 129 and the Commission's *Implementation Order*. In the Assessment Application, the Company requested that the Commission issue an order approving: (1) the procedure used to evaluate and select a primary AMI vendor, (2) the Company's Assessment of Needs, (3) the Technology Section of RF mesh and associated findings, (4) the selection of the Company's Primary AMI vendor, (5) updated cost projections for the entire Smart Meter Project and Deployment, and (6) any other approvals that the Commission deemed to be necessary.

On January 31, 2011, the Company filed a Supplement to its Assessment Application. In the Supplement, Duquesne Light identified Itron, Inc. ("Itron") as its recommended primary contractor to design, construct, implement and oversee the Company's Smart Meter program.

The Company explained that it had issued bids for smart meter contractors and received four bids. Itron scored the highest on a technical evaluation of the bids and provided the lowest cost solution of the four bidders. In the Supplement, Duquesne Light requested Commission approval of the initial Assessment Application and Supplement. No party objected to the Company's Assessment Application or its Supplement. The Commission did not issue an Order with respect to the Assessment Application or the Supplement thereto.

On March 31, 2011, the Company filed its Establishment of Network Design for the Duquesne Light Smart Meter Program ("Network Design") with the Commission. Therein, the Company explained that it had conducted a study to review the Company's existing communication infrastructure, review network and communication infrastructure necessary for the AMI and also review available private and public written communications solutions. Specifically, the Company evaluated:

- Operating Frequencies Available in its Service Territory;
- Radio Technologies/Vendors;
- Solution Cost (up front and ongoing)
- Expected capacity, bandwidth, latency and reliability of each option;
- Security provisions (public versus private writers communications); and
- Advantages and disadvantages of available solutions.

The initial Network Design conclusions supported the use of private wireless options as the primary communication methodologies, with public wireless as a backup communication. The Company also noted that further analysis was necessary to finalize the Network Design Study conclusions and that the proposed design was subject to change based on further findings or in the event that other viable technologies would become available.

On June 30, 2011, the Company made an additional milestone filing related to the design, testing and certification of Electronic Data Interchange ("EDI") transactions. Therein, Duquesne Light explained that it would be able to provide customers with direct access to non-validated real time data directly from the smart meter through a residential customer's Home Area Network (HAN).

Validated hourly interval data would be provided through a secure web portal within 24 hours from the completion of the data upload for the entire population of Duquesne Light's smart meters to the MDM systems. Additionally, non-validated, real time data would be provided to third parties through a secure, authenticated connection at the expense of the third party. Validated hourly interval data would be provided to third parties through a standard interface consistent with the North American Energy Standards Board within 24 hours of the completion of the data upload for the entire population of Duquesne Light's smart meters to the MDM systems. Finally, the Company would provide EDI access to smart meter data to authorized commercial operators, such as conservation service providers and electric generation suppliers ("EGS") using the 867 historical interval usage transaction.

On October 6, 2011, the Company filed an Installation, Testing and Rollout of Support Equipment and Software Update filing. The purpose of the October 6 update filing was to outline the equipment testing that the Company planned to conduct prior to deploying AMI meters across its service territory.

On November 2, 2011, the Company filed a status update related to its Establishment of Plans for Installation of Meters and Outside Communications and Training. Therein, the Company provided an overview of its smart meter deployment plan, a high level Smart Meter Program Schedule and Milestones, and an overview of its Staff Training Plan.

On November 18, 2011, the Company filed a status update with respect to its Smart Meter Plan and further requested a six month extension, from December 31, 2011 to June 30, 2012, to file the Company's Final Smart Meter Plan. With respect to the status update, the Company provided a summary of the work that it had done in the previous 18 months. In addition, the Company noted that there were several smart meter issues that it was still reviewing.

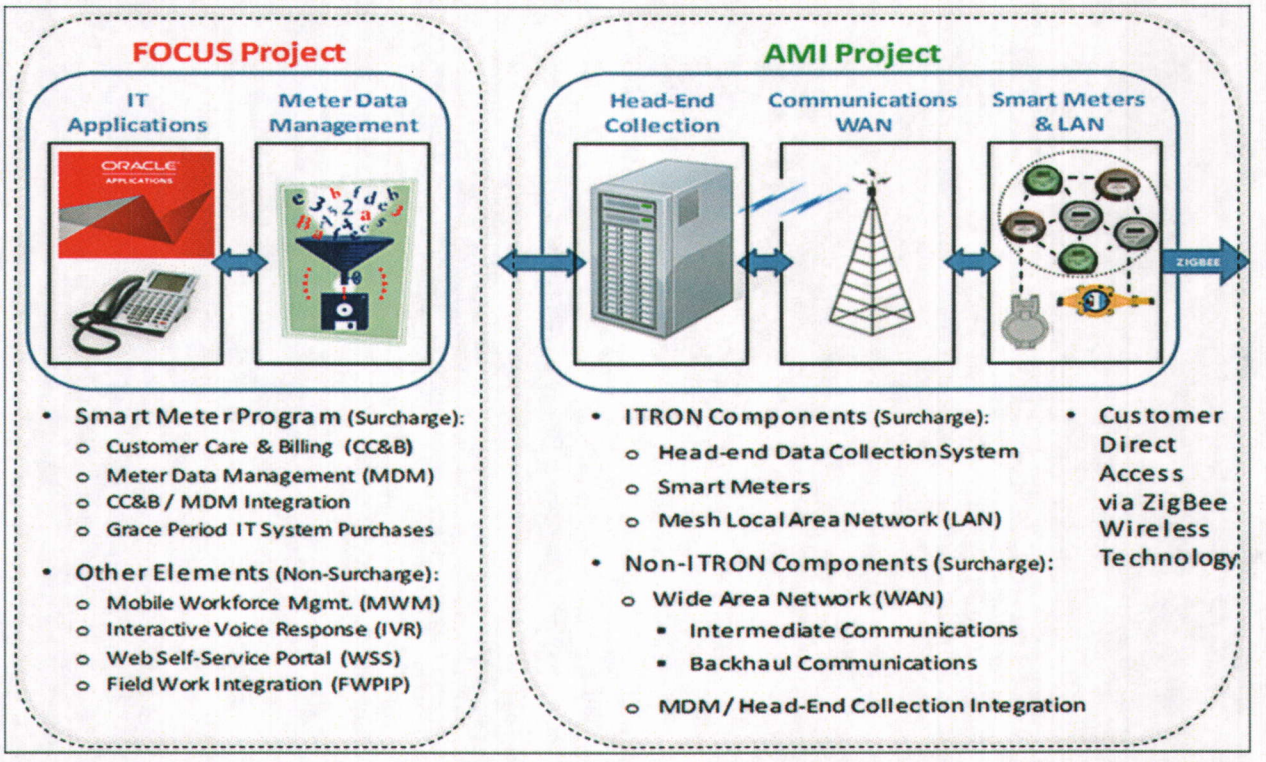
On December 13, 2011, the Commission issued a Secretarial Letter granting the Company's request for an extension, until June 30, 2012, to file its Final Smart Meter Plan. Pursuant to the Commission's December 13, 2011 Secretarial Letter, Duquesne Light hereby files its Final Smart Meter Plan.

III. FINAL SMART METER PLAN

A. INTRODUCTION

Duquesne Light's Smart Meter Program consists of two major projects, FOCUS and AMI. Diagram #1 provides a high-level overview of the scope of Duquesne's Smart Meter Program.

Diagram # 1: Duquesne Smart Meter Program – Two Major Projects



Under the FOCUS project, Duquesne Light is replacing its customer information system with a Customer Care and Billing ("CC&B") system and is implementing a new Meter Data Management ("MDM") system. The Commission approved the upgrade of these Information Technology ("IT") systems in the Company's Initial Smart Meter Plan. The upgrade of these IT systems is necessary in order for Duquesne Light to provide smart meter technology to customers.

Under the AMI project, Duquesne Light will install Itron smart meters, develop necessary communication networks and install a head-end data collection engine for smart meter data. In addition, Duquesne Light will hire a systems integrator to integrate all of the separate

components of the Company's Smart Meter Program. This is a critical function in order to ensure seamless operation of the AMI system.

As explained below, Duquesne Light proposes to deploy its AMI System over a seven-year period. The seven-year period includes a two-year ramp up period to allow systems testing before they are implemented on a broader scale. At the end of the two-year ramp up period, the Company proposes a deployment schedule of 9,000 meters per month with full deployment by the end of 2020. In addition, the Company proposes to phase-in AMI functionalities over time to allow the markets for these functionalities to become more mature. The Company's AMI System will meet all of the requirements of Act 129 and provide all of the additional capabilities set forth in the Commission's *Implementation Order*, after all functionalities are phased-in.

The total Smart Meter Program will cost approximately $238 million. The Company has provided additional details regarding these costs herein. In addition, the Company proposes to continue to recover its smart meter costs through its SMC.

These topics are discussed in more detail below.

B. FOCUS PROJECT

In its *Implementation Order*, the Commission recognized that a fully functional smart meter involved more than just the meter hardware attached to the customer's premises. *Implementation Order*, p. 6. Therein, the Commission stated as follows:

> A fully functional smart meter that supports the capabilities required by Act 129 and as outlined below, involves an entire network, to include the meter, two-way communication, computer hardware and software, and trained support personnel.

Consistent with this direction from the Commission, Duquesne Light explained in its Initial Smart Meter filing that it was required to replace its billing, data collection and back-office systems in order to provide smart meter technology to customers. This project is called the FOCUS Project.

The FOCUS project encompasses significant upgrades to the Company's existing IT system architecture in order to provide the back-office foundation necessary to successfully deploy smart meters. Duquesne Light's current customer information system ("CIS") is adequate for sustaining existing business requirements, but is insufficient for meeting Act 129 and the Commission's *Implementation Order* Smart Meter requirements. Functionality enhancements such as TOU rates, real-time price programs, remote disconnect and reconnect, direct access to price and consumption information, and the automatic control of customer's electric consumption cannot be supported without replacing Duquesne Light's existing CIS. Furthermore, Duquesne Light's existing back-office IT architecture is not designed for the proliferation of data inherent in providing hourly or even more granular interval usage information to all of our customers on a daily basis. Therefore, in conjunction with replacing our CIS, Duquesne Light must implement an MDM system as well as integrate this new system with the replacement CIS.

As part of FOCUS project scope within Duquesne Light's Smart Meter Program, the Company is now implementing the Oracle Customer Care and Billing ("CC&B") module within the Utility Application Suite to replace our existing CIS. In addition, Duquesne Light has purchased the Oracle MDM module and is currently implementing this component of the Utility Application Suite as well as integrating it with CC&B as a part of the FOCUS project. The implementation and integration of these two modules provides the necessary IT system foundation components to support the subsequent extension of this architecture for AMI system capabilities. The FOCUS project is an integral part of Duquesne Light's Plan for meeting Act 129 and the Commission's *Implementation Order* requirements.[1]

The FOCUS project started in July 2010 after Commission approval of the Company's Initial Smart Meter Plan and is projected to be completed by the end of the second quarter of 2013. There are five general phases during the FOCUS project lifecycle and timeline is as follows:

[1] The FOCUS project also includes several supporting scope components that are not part of Duquesne Light's Smart Meter Program. Some of these more significant components include the implementation of the Oracle Mobile Workforce Management ("MWM") module as well as its integration with CC&B, the replacement of our existing Interactive Voice Response ("IVR") system, and the redesign of our Outage Analysis System ("OAS") and Web Portal ("WSS") to work with CC&B.

- Discovery (Define Scope): July 2010 to November 2010
- Analysis (Gather Requirements): December 2010 to August 2011
- Assembly (Design & Build): August 2011 to May 2012
- Acceptance (Test & Train): June 2012 to March 2013
- Deployment (Go-Live & Support): April 2013 to June 2013

C. AMI PROJECT

1. Introduction

There is a growing demand for sophisticated metering (e.g., net metering), meter data management and price responsive rates as customers have a greater interest in reducing their electric bill. These new demands and requirements cannot be met with Duquesne Light's current meter and system infrastructure.

Pursuant to the milestones detailed in the Company's Initial Smart Meter Plan, Duquesne Light filed an assessment of its AMI technology requirements and potential solutions on December 29, 2010. In this filing, Duquesne Light describes the comprehensive process it undertook with its AMI advisor, SAIC, Inc. ("SAIC") (formerly R. W. Beck), to assess its current AMR technology environment as well as explicitly document the Company's requirements for a future AMI technology environment in the form of a formal Request for Proposal (RFP). The December 2010 filing also described the rigorous RFP process that the Company followed with its AMI advisor to create a short-list of two AMI vendors with similar solutions that best addressed Duquesne Light's needs ranked exclusively on technical merit. In a supplemental filing submitted on January 31, 2011, Duquesne Light advised the Commission concerning the selection of ITRON's OpenWay solution as the most cost effective AMI system for addressing its needs.

In the first step of defining the AMI project scope, a technology needs assessment was performed to identify the necessary AMI requirements to minimally meet ACT 129 smart meter requirements, as well as the additional requirements outlined in the Commission's *Implementation Order*. The requirements assessment was performed by outlining the current

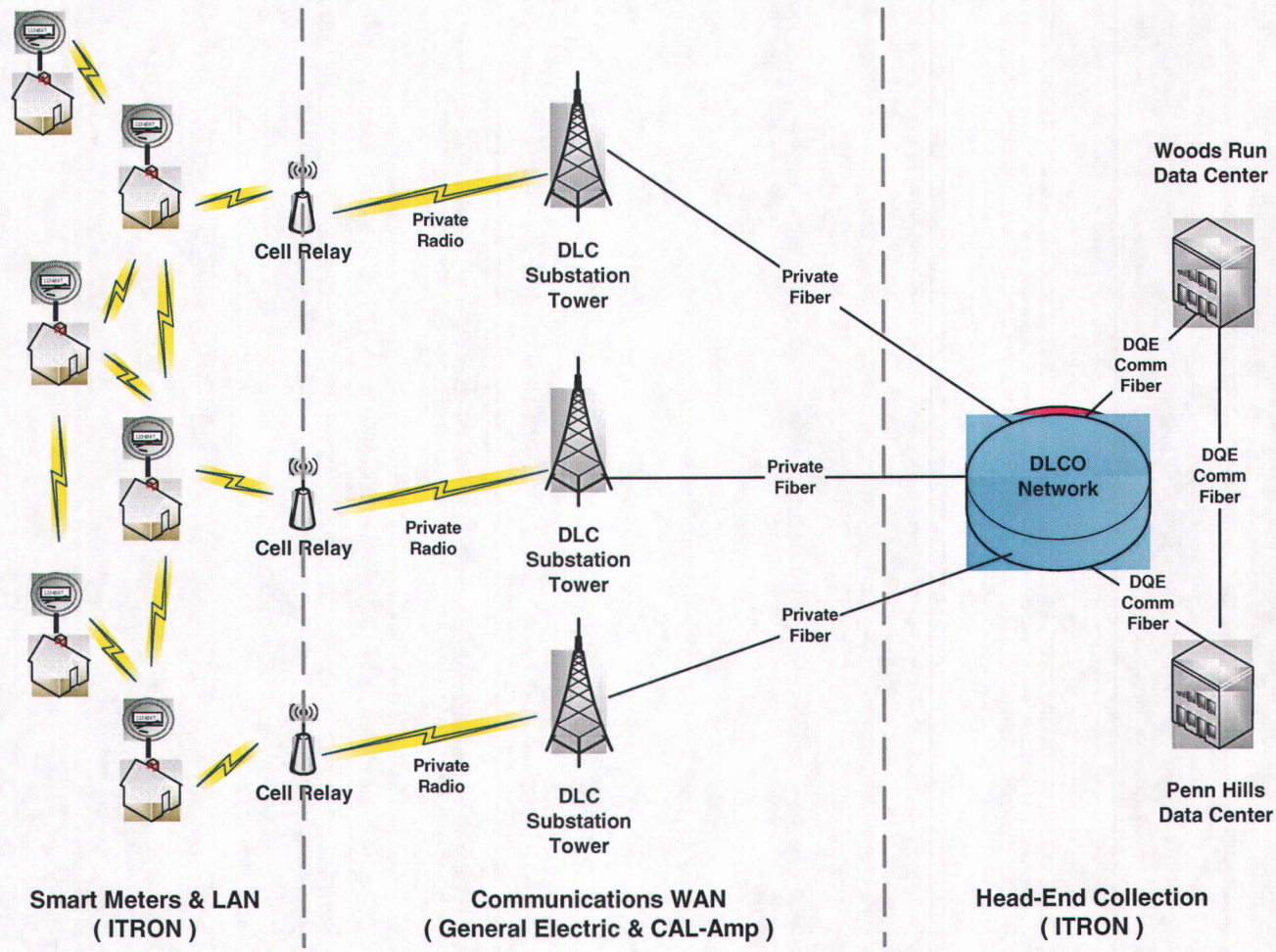
state of Duquesne Light's technology, including AMR and back-office supporting systems, either currently installed, or planned for installation, that would either directly or indirectly integrate with AMI during the Smart Meter deployment phase. By understanding the current environment, AMI requirements could be defined and outlined in a detailed RFP which would ensure that the solutions AMI vendors proposed succinctly addressed Duquesne Light's needs.

Duquesne Light's proposed AMI solution includes four components. These four components are:

- Smart Meters
- Local Area Network
- Wide Area Network
- Head End Data Collection Engine

Diagram 2 below provides an overview of the AMI System Components.

Diagram # 2: Duquesne AMI System Architecture



Duquesne Light plans to replace all existing AMR meters with new smart meters that will provide two-way communication between each customer premise and the utility. All single phase meters will be equipped with ZigBee[2] data channels to enable customers direct access to interval usage data, and provide a platform for future HAN applications. The selected AMI solution is capable of providing interval data for all meters, and single phase meters will be equipped with an internal switch for remote connections and disconnections.

[2] ZigBee is a commonly used communication specification for advanced metering systems. ZigBee has the ability to link smart meters with devices such as thermostats, household appliances, HVAC and other equipment that uses electricity.

2. Smart Meters

Duquesne Light proposes to install ITRON smart meters for all customers. The ITRON Smart Meters include the latest advanced metering technology, including bidirectional data communications, ZigBee direct access capabilities and a remote connect/disconnect switch. The ITRON smart meters and related advanced metering infrastructure discussed below will meet all of the six minimum smart meter requirements set forth under Act 129, including:

1. Bidirectional data communications.
2. Reading usage data on at least an hourly basis once per day.
3. Providing customers with direct access to and use of price and consumption information.
4. Providing customers with information on their hourly consumption.
5. Enabling TOU rates and RTP options.
6. Supporting the automatic control of the customers' electric consumption.

In addition, the ITRON Smart Meters and related advanced metering infrastructure will meet all of the nine additional smart meter requirements set forth in the *Implementation Order*, including:

1. Ability to remotely disconnect and reconnect.
2. Ability to provide 15-minute or shorter interval data to customers, EGSs, third-parties and an RTO on a daily basis, consistent with the data availability, transfer and security standards adopted by the RTO.
3. On-board meter storage of meter data that complies with nationally recognized non-proprietary standards such as ANSI C12.19 and C12.22 tables.
4. Open standards and protocols that comply with nationally recognized non-proprietary standards, such as IEEE 802.15.4.
5. Ability to upgrade these minimum capabilities as technology advances and becomes economically feasible.
6. Ability to monitor voltage at each meter and report data in a manner that allows an EDC to react to the information.
7. Ability to remotely reprogram the meter.

8. Ability to communicate outages and restorations.

9. Ability to support net metering of customer-generators.

Further explanation regarding how Duquesne Light's AMI system will meet all of the six minimum smart meter requirements set forth under Act 129 and will meet all of the nine additional smart meter requirements set forth in the *Implementation Order* is provided in Section E below. In addition, the specific technical capabilities of the ITRON smart meters, including the AMI standards supported by the ITRON smart meters are set forth in Appendix A.

3. Mesh or Local Area Network ("LAN")

The LAN consists of the transmission of data between ITRON smart meters and ITRON cell relays. The LAN has the following features:

- An RF mesh based solution that is capable to being Upgraded to an IPv6 based mesh solution
- Bi-directional communication
- Operates in the unlicensed 900 MHz band
- 902-928 MHz Bandwidth (with frequency hopping signaling)
- Supports 142-153 kilobits per second ("kbps") throughput
- Each cell relay supports up to approximately 2,000 meters
- Support of IP and native DNP protocols when running the full IPv6 solution

4. Wide Area Network ("WAN")

The WAN provides data communications between the LAN and the Head-End data collection system. A diagram of the AMI system architecture, including the WAN, is shown on Diagram 2 above.

The solution for the WAN component of the AMI system was determined with the assistance of SAIC. Pursuant to the milestones detailed in the Company's Initial Smart Meter Plan, Duquesne Light filed a preliminary design for the AMI communication network on March 31, 2011. In this preliminary design of the WAN component of the AMI system, Duquesne Light proposed a private radio solution as opposed to a public wireless solution for the intermediate portion of the WAN, which connects the cell relays that are part of ITRON's LAN to existing Duquesne Light owned communication towers. See Diagram # 2. The preliminary design also

proposed leveraging the private fiber currently leased by Duquesne Light from DQE Communications that already exists between Duquesne Light's communication towers and data center for the back-haul portion of the WAN. At the time of the March 31, 2011 filing, this preliminary design was determined to be the most cost-effective solution for the WAN component of Duquesne Light's AMI system. The following is a bulleted summary of the Company's preliminary due diligence efforts.

- Engaged SAIC in November 2010 to assist with the AMI Communication Network technology and cost assessment
- Analyzed multiple Private Licensed Wireless (Radio), Private Unlicensed Wireless (Radio) and Public Wireless alternatives for the LAN Cell Relay to Tower communication network
- SAIC recommended a combination of two Private Licensed Wireless solutions (3.65 GHz & 220 MHz) as cost effective alternatives that best met Duquesne Light's technological requirements
- Recognizing the potential unavailability of 220 MHz spectrum in DLC territory, the recommendation also included 900 MHz as a replacement
- It was noted that public wireless could be used as a back-up to the private wireless solution
- Filed preliminary communications network design with PA PUC in March 2011 based on SAIC's recommendation

In requesting and subsequently receiving a six month extension for filing our Final Smart Meter Plan, Duquesne Light committed to performing additional due diligence related to private versus public WAN solutions in light of new information that public carrier price offerings were becoming more cost competitive. After several more months of analysis, Duquesne Light confirmed that a private wireless solution as originally proposed is the best solution because it provides Duquesne Light with more control over the security and reliability of the system as well as strategic opportunities to utilize available bandwidth for other data communication applications including mobile workforce, SCADA, and corporate security. The private wireless solution has more initial costs than a public wireless solution. However, the private wireless solution has considerable annual O&M savings which offset the initial upfront costs over the life

of the system. A financial analysis between private versus public networks was too close to conclusively drive the decision of one type over the other.

The following is a bulleted summary of our additional due diligence efforts.

- Met with WAN vendors to determine availability of licensed spectrum in Duquesne territory
- Determined that 220 MHz was not an available spectrum
- Reserved 900 MHz spectrum from Space Data through a 15 month lease with an option to buy upon termination
- Worked with SAIC and ITRON to develop a Propagation study to evaluate coverage capabilities of the 3.65 GHz and 900 MHz Private Licensed Wireless solution
- Finalized capital and on-going O&M cost estimates of private and public solutions based on the propagation study
- Developed a detailed cost comparison between the Private Licensed Wireless solution and the Public Wireless solution
- Determined that the private wireless solution was still the best value for Duquesne Light
- Filed a private wireless solution for the WAN component of our AMI system as part of this Plan

5. Technical Advantages of the New AMI System

There are several distinct technical advantages associated with the proposed AMI system architecture network over the existing AMR system. First and foremost, the existing AMR system architecture only supports a single directional data flow (from meter to head-end data collection engine), whereas the proposed AMI System architecture supports a bi-directional data flow.

Secondly, the existing AMR system LAN solution requires each meter to be in the line of sight of a Cell Control Unit ("CCU") in order to communicate. The new AMI system LAN solution uses mesh network technology which enables meters to communicate to each other. A meter that is not in line of sight of a cell relay communicates its data to a neighboring meter that in turn communicates its data to a neighboring meter and this process continues until the data is

consolidated at a meter that does have line of sight to a cell relay. This mesh network technology only requires a portion of the meters to be in the line of sight of a cell relay in order for all meters to be read. Since most meters have several neighboring meters, the mesh network technology also provides redundant paths for communicating data to a cell relay. Therefore, the AMI system solution greatly reduces the amount of LAN components that need to be installed in order to cover all of Duquesne Light's service territory. This will make it more cost effective to read 100% of Duquesne Light's meters at least once daily rather than the 80 to 90% that are being read daily with the AMR system.

Finally, the existing AMR system architecture requires multiple, disparate solutions to communicate with all of Duquesne Light's meters. These solutions differ for all three system components including the type of meter data communications; the WAN communication protocols; and the head-end collection engine applications. The AMI system architecture uses a single type of meter data communications; a common WAN communication protocol and the same head-end data collection engine application to communicate with all of Duquesne Light's meters.

6. Head-End Data Collection Engine

As part of its AMI Project, Duquesne Light must install a Head-End Data Collection Engine. The Head-End Data Collection Engine performs network management and coordinates data collection and operations. The Head-End Data Collection Engine has the following characteristics:

- Collects interval meter usage data for all single phase and three phase meters.
- Support scheduled (automatic) and unscheduled (operator-initiated) meter reads.
- Remotely downloads updates to meter settings, configuration, security settings, and firmware for all AMI devices.
- Obtains meter data, such as register and power status, on demand.
- Communicates with groups of AMI meters and consumer owned control devices to enable load management.

- Collects and reports measurement data, control events, self-test data and alerts, service continuity data and alerts, power quality data and alerts (including tamper), programming events, configuration settings, etc.
- Monitors, analyzes, and manages service continuity.
- Supports and reports service continuity and voltage interruptions.
- Supports monitoring, analyses, and management of customers' power quality.
- Supports customer (scheduled and unscheduled) load control functions.
- Provides automatic self-registration of AMI endpoints/meters.
- Supports meter self testing, system performance monitoring and reporting.
- Effectively employs Service Oriented Architecture ("SOA") and/or Enterprise Service Bus ("ESB") technologies for communication among its application modules and for interoperation of its system components with Duquesne's other information systems.

D. IT SYSTEMS

1. Introduction

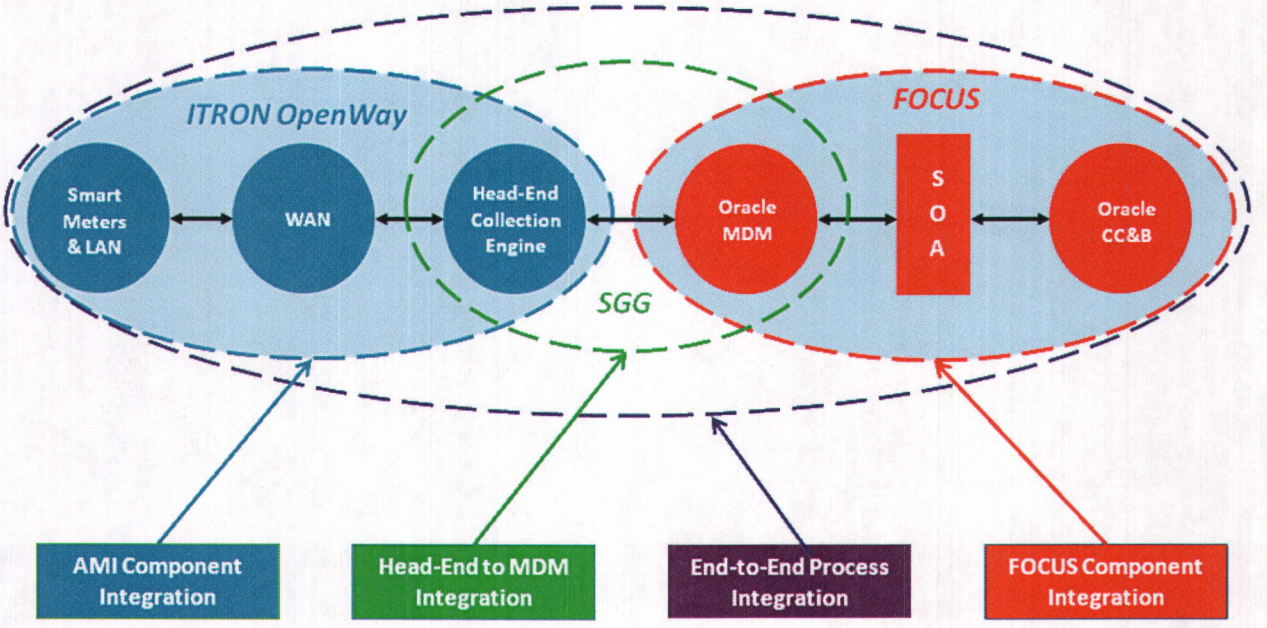
In addition to the AMI Project scope described in the section above, Duquesne Light's Final Smart Meter Plan includes the implementation, ongoing support and multifaceted integration of several IT systems. Some of the more significant of these IT systems such as Oracle's CC&B and MDM will be implemented and integrated as part of the Focus Project but will also require further systems integration and functional enhancements as part of the AMI project.

Much of the systems integration and ongoing support work requires specific expertise and technology skills that are not available within Duquesne Light's existing internal IT staff. Therefore, the Plan supplements Duquesne Light's resources with third party IT vendor delivery and support resources as well as third party Systems Integrator ("SI") resources. Duquesne Light will embark on a formal RFP process to select a qualified SI in the latter half of 2012. Duquesne Light also plans to negotiate a contract with the selected SI that will be executed upon approval of our final Smart Meter Plan.

2. Systems Integration

As shown on Diagram #3 below, Duquesne Light's Smart Meter Program has four levels of complex systems integration that must work both independently as well as in conjunction with each other in order for the entire solution to function properly.

Diagram #3: Duquesne Light Systems Integration



The first level of systems integration is to establish a bidirectional interface between the CC&B and MDM components of the FOCUS project. The integration of these two components is facilitated through Oracle's Services Oriented Architecture ("SOA"). All meter usage data is validated, edited and estimated ("VEE") by the MDM module before it is passed to CC&B on a request basis for billing purposes. This cleansed usage data along with meter events such as tamper notifications is also utilized to support other customer oriented transactions such as high bill complaints, meter inspections and the automated completion of service orders that require a meter read.

The second level of systems integration is to establish a bidirectional interface between the Smart Meters deployed at customer premises and the Head-End Collection Engine installed at Duquesne Light's data center. The integration of these two components is facilitated through the AMI system communication network, which includes the LAN and the WAN. The Smart Meter

records interval data on at least an hourly basis which then must be collected from the field at least once daily by the Head-End Collection Engine. The LAN and WAN provide the connectivity necessary to accomplish this automated data collection. This bidirectional interface is also used for collection of meter events and alerts as well as to perform firmware upgrades within the meter.

The third level of systems integration is to establish a bidirectional interface between the Head-End Collection Engine and the MDM module. The integration of these two components is facilitated through Oracle's Smart Grid Gateway ("SGG"). SGG provides standard adapters for data exchange between Head-End Collection Engines from leading AMI vendors and Oracle's MDM module. All requests for meter usage data, events and alerts from Smart Meters are initiated from the MDM module. Therefore, the Head-End Collection Engines receives all of its instructions on what data to collect from the field as well as when to collect this data through the SGG.

The fourth level of systems integration is to establish end-to-end business processes that leverage the bidirectional interfaces between all of the components that were implemented and interfaced in the previous three levels. These end-to-end business processes include base metering functions such as monthly billing; daily displays of usage data on a customer web portal; commissioning and decommissioning of meters; and on-demand meter reads as well as advanced metering functions such as remote connects and disconnects; automated control of electric consumption; and provisioning of HAN devices.

3. Functional Enhancements

There are many functional enhancements to IT systems required to meet the smart meter requirements of ACT 129 and the Implementation Order, which are described in more detail in the AMI System Capabilities section of this plan. In addition, there are other functional enhancements to IT systems that leverage these AMI system capabilities to provide expanded self-service offerings to our customers as well as better information for our customer service representatives. These functional enhancements are described in more detail in the following appendices to this Plan:

- Bill-to-Date & Projected Bill – Appendix B
- Bill Alerts – Appendix C
- Smart Meter Usage Display – Appendix D
- Web Dashboard – Appendix E

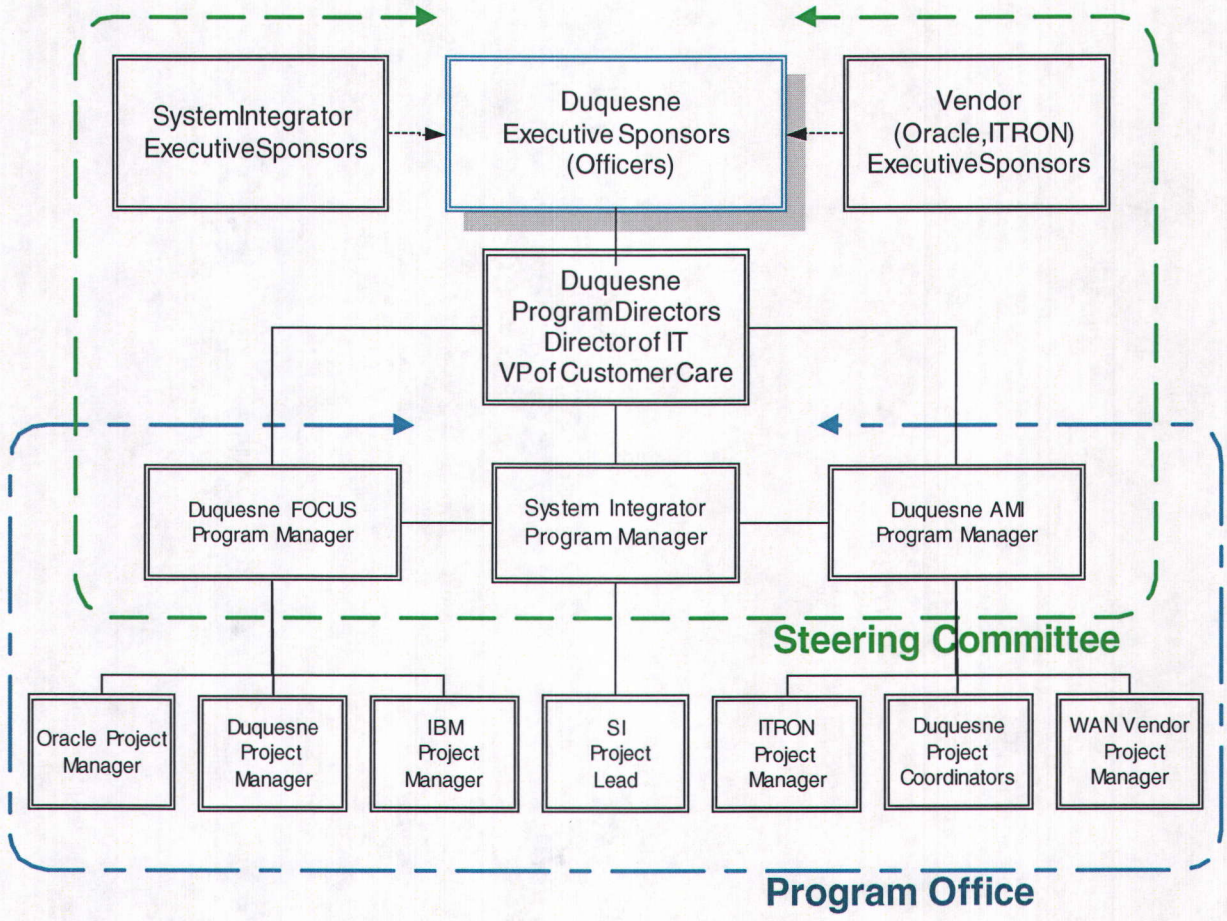
4. Systems Integrator

The complexity of integrating multiple IT systems from multiple vendors across several lines of business such as customer care and metering operations along with deploying all new advanced meters and communication networks requires specific expertise across several technology disciplines that does not exist internally within Duquesne Light. Therefore, Duquesne Light plans to engage a Systems Integrator (SI) to manage the IT systems work effort within the AMI project. The success of the AMI project is highly dependent on engaging an SI that has utility industry experience with both AMI technology projects as well as with Oracle Utility Application Suite implementations. The SI will have ultimate responsibility for the implementation of the remaining three levels of integration (the first level will be complete upon implementation of the FOCUS project) of Duquesne Light's Smart Meter Program. This responsibility includes oversight of the IT system integration and functional enhancement work being performed by other vendors including Oracle and ITRON.

Working with Duquesne Light, one of the initial tasks for the SI will be to finalize the phased implementation approach for the AMI Project. Phased scope definition is established by considering a variety of factors including business criticality and benefit, regulatory mandates, customer needs, overall program risk mitigation, technology availability and delivery, incremental change that users can adapt to and embrace, and other key considerations.

Once the implementation approach and individual phase scopes are confirmed, a detailed project plan will be developed including main tasks, deliverables, milestones and schedule. A Program Management Office (PMO), consisting of Duquesne Light, SI, Oracle, ITRON and other vendor resources will be established to manage and monitor the execution of this plan.

Diagram #4: Duquesne Light Smart Meter Program Management Office



Simply defined, System Integration looks beyond a single, independent system or solution delivery with the knowledge, responsibility, and accountability to validate the enterprise solution delivers as planned and is maintainable and supportable over the useful life of the system. System integration encompasses both business and technical integration of applicable processes. Duquesne Light's Final Smart Meter Plan proposes that the SI will act as an implementation advisor driving day-to-day results by validating constant and consistent alignment of the business vision to the technical solution; managing to an integrated program view vs. individual project views; managing overall program dependencies and interactions between related projects and initiatives; balancing competing interests to provide solutions delivering optimal enterprise results; seeking to eliminate overlap, duplication, and redundancy in program activities; and ensuring individual component applications (new, existing, third party) can support end-to-end

business processes. The specific services provided by the SI are detailed in Appendix F to this plan.

5. On-going Support

The IT systems being implemented as part of both the FOCUS project and AMI project require significant ongoing support. Duquesne Light's Final Smart Meter Plan provides for this support through the end of the deployment period in the form of annual maintenance agreements with Oracle and ITRON as well as managed service agreements with a third party IT support vendors.

E. AMI SYSTEM CAPABILITIES

In the Commission's *Implementation Order*, the Commission identified six minimum smart meter capabilities that are required by Act 129. *Implementation Order*, pp. 29-30. The commission directed EDCs to quantify the costs to deploy and operate these six minimum capabilities in EDCs' Smart Meter Plans.

In addition, the Commission listed nine additional capabilities that EDCs were to evaluate. The Commission also directed EDCs to quantify the individual incremental costs for deploying these additional capabilities. The Commission further noted that it may waive these additional capabilities to the extent that an EDC or another party demonstrated that the additional capabilities were not cost-effective.

Duquesne Light addresses each of the minimum and additional capabilities set forth in the *Implementation Order* below.

1. Minimum Capabilities Under Act 129

a. Bidirectional data communications

The Company's existing AMR system provides one-way communication from the meter to the head-end data collection engine hosted at Duquesne Light's data center. The new AMI system will provide two-way communication between the meter and the head-end data collection engine hosted at Duquesne Light's data center.

b. Recording usage data on at least an hourly basis once per day

The Company's existing AMR system records usage data on a daily basis for most of our single-phase meters and on at least an hourly basis for all of our three-phase meters. The new AMI system will have the capability of recording usage data at 5, 10, 15, 30 or 60 minute intervals. The Company's AMI communication network will provide the capability to retrieve this data at least once per day for all meters.

c. Providing customers with direct access to and use of price and consumption information

The Company's existing AMR system does not have any direct access capabilities. The new AMI system will include ZigBee enabled smart meters that under current data communication standards can facilitate direct access from the meter to a customer's HAN device for price and consumption information. Duquesne Light will remotely provision and enable the direct access interface once the customer request for direct access has been authenticated. The customer will be responsible for purchasing and installing their own HAN devices as well as establishing the network connection with the ZigBee interface.

d. Providing customers with information on their hourly consumption

The Company's existing AMR system provides most customers with validated daily consumption information through Duquesne Light's secure customer web portal. The new AMI system will provide all customers with validated hourly consumption information within approximately 24 hours after the data has been collected from all meters through Duquesne Light's secure customer web portal.

e. Enabling time-of-use (TOU) rates and real-time price (RTP) programs

The Company's existing AMR system only supports TOU or hourly rates for customers with three-phase meters. The new AMI system will support TOU rates and RTP programs for all customers. As part of the company's Act 129 Smart Sense pilot, Duquesne Light will develop TOU and/or RTP tariffs for our default service customers with smart meters. Duquesne Light

will also be able to support TOU rates and/or RTP programs offered by EGS's for our customers with smart meters that switch to an alternate supplier.

f. Supporting the automatic control of the customer's electric consumption

The Company's existing AMR system cannot support the automatic control of the customer's electric consumption. The new AMI system, with its bidirectional data communication and ZigBee enabled smart meters, can be utilized to support demand response or load limiting programs. Duquesne Light plans to enable third party access to our AMI system for these types of programs through a secure web portal. However, Duquesne Light does not plan to commit to any service level agreements with third parties using our AMI system to facilitate these types of programs.

2. Additional Capabilities under Implementation Order

a. Ability To Remotely Disconnect And Reconnect

Remote disconnect and reconnect functionality allows utilities to turn off or turn on a customer's service at the meter without a physical visit to the premise. This capability is accomplished through additional hardware (a switch) integrated into the meter. This capability is only available for single-phase meters having a 240 volt service with a rating of 200 amps or less.

There are many benefits to implementing the remote disconnect and reconnect functionality. These benefits include improved safety, operational efficiency, revenue collection, employee efficiencies and improved customer experience.

There is an additional cost of approximately $30 per single phase meter to install the switch to enable the remote disconnect/reconnect functionality. In addition, the Company's FOCUS system would require upgrades costing approximately $500,000 to provide this functionality. The expected cost to install this functionality on a system wide basis is approximately $17.5 million.

Duquesne Light believes that the benefits of this functionality support implementation. For these reasons, Duquesne Light proposes to implement the remote connect/disconnect functionality for all single-phase meters.

b. Ability To Provide 15-Minute Or Shorter Interval Data

As previously stated, the Company's Smart Meters will be capable of recording data in 15 minute intervals at no incremental cost as compared to recording usage at hourly intervals. However, the bandwidth of the AMI communication network as well as the storage capacity of the Head End Data Collection Engine and Oracle MDM system would have to be expanded at an incremental cost to accommodate intervals more granular than hourly.

Duquesne Light does not believe these incremental costs are justified at this time since there are no existing requirements for interval data more granular than hourly. However, since expansion of network bandwidth and storage capacity is scalable, the Company proposes implementing an AMI system based on hourly interval data and then expanding it later if future applications require more granular intervals.

c. On-Board Storage Of Meter Data That Complies With Nationally Recognized Non-Proprietary Standards Such As ANSI C12.19 and C12.22 Tables

The ANSI C12.19 standard provides a common data structure for use in transferring data to and from meters. The ANSI C12.22 standard defines how to transmit standardized tables of meter data across wired or wireless networks. This standard uses encryption to enable secure communications, protecting confidentiality and data integrity.

The Company's AMI System will comply with these standards without any additional implementation costs.

d. Open Standards And Protocols That Comply With Nationally Recognized Non-Proprietary Standards, Such As IEEE 802.15.4

IEEE 802.15.4 is a communication standard for low rate wireless personal networks such as ZigBee. ZigBee has the ability to link smart meters with devices such as thermostats, household appliances, HVAC, lighting systems and other household appliances or systems.

The Company's AMI system will comply with the IEEE 802.15.4 standard without any additional implementation costs.

e. Ability To Upgrade Minimum Capabilities As Technology Advances And Becomes Economically Feasible

The capability is whether existing equipment can adopt or be modified to incorporate new capabilities as technology advances. Duquesne Light cannot predict all future needs or technologies. However, the Company is implementing an AMI system that is flexible and expandable. Moreover, Duquesne Light will be able to upgrade the software for its AMI system, including meter firmware and configuration.

f. Ability To Monitor Voltage At Each Meter And Report Data In A Manner That Allows An EDC To React To The Information

The AMI system that Duquesne Light is implementing will provide the capability to monitor voltage at each meter. This monitoring can be accomplished by establishing a register within the Smart Meter for voltage related interval data or by programming the Smart Meter to send an alert if the voltage measurements are outside a normal range.

In order to report voltage data in a manner that allows an EDC to react to the information, an interface needs to be developed between the AMI Head-End Collection Engine and the FOCUS project MDM system. Duquesne Light's approach to developing these type of interfaces is to participate in Oracle's Smart Grid Gateway ("SGG") Customer Validation Program. This program enables Duquesne Light to influence the development of productized integration between ITRON and Oracle applications. At this point in the development cycle, Oracle has not

committed to a date for implementing the voltage monitoring interface requirements as part of their SGG roadmap so incremental cost information is unavailable.

In addition to developing the integration between AMI and FOCUS systems, new reporting functionality will need to be developed within the MDM application in order for Duquesne Light to react to the voltage monitoring. At this point in the MDM development roadmap, Oracle has not committed to a date for adding enhanced reporting functionality for voltage monitoring.

Since Oracle has not committed to dates for voltage monitoring capabilities, the incremental cost for developing the required productized integration and reporting functionality is unknown. However, Duquesne Light anticipates that it will implement the voltage monitoring capability, as a supplement to existing power quality systems, once the necessary software becomes available.

g. Ability To Remotely Reprogram The Meter

Firmware within the meter controls all of the functions and capabilities of the meter. Firmware is the software that interfaces the meter's hardware and the network application, enabling the meter to perform its functions. The firmware in the Company's Smart Meters can be reprogrammed remotely through the communications network or at the meter.

There are no additional meter or network costs to be able to remotely program the Smart Meter's firmware.

h. Ability To Communicate Outages And Restorations

The AMI architecture provides the capability to communicate outages and restorations from the Smart Meter to the Head-End Collection system. This communication is based on a "last gasp" alert that the meter sends when it loses power along with a subsequent "first gasp" alert when power is restored. This functionality does not exist in Duquesne Light's existing AMR system.

In order to incorporate AMI outage and restoration alerts into the Company's real-time reliability and customer notification processes, Duquesne Light would need to replace its current Outage Management System ("OMS") as well as develop and maintain a distribution system "Electrical Model". This replacement initiative is not included in the scope of the FOCUS project.

Duquesne Light estimates that the incremental cost to create an Electrical Model are not justified as part of the Company's Final Smart Meter Plan, but will be further evaluated as the AMI system is deployed.

Duquesne Light does plan to implement the capability to communicate outages and restorations from the Smart Meters to the Head-End Collection Engine as part of the AMI project. In addition, Duquesne Light plans to extract the data from the Head-End Collection Engine into an AMI data warehouse on a near real-time basis. The data warehouse will include reporting functionality that provides the Company's Operations Center with the following data:

- Number of customers that are out of power at any given time during an outage event.
- A list of customers that have been restored at any given time during an outage event.
- The length of time between when a customer lost power and when that customer's power was restored.

This reporting functionality in the AMI data warehouse will replace and improve the accuracy of all of the information that the Company's Operations Center currently receives from its existing AMR system. This initiative is estimated to cost approximately $250,000.

i. Ability To Support Net Metering Of Customer Generators

Duquesne Light's Smart Meters will support net metering of customer generators. The ITRON Smart Meters will have multiple channels and bi-directional capability that will allow the Company to measure both the excess energy that is being generated by the customer and also measure energy that is delivered by the Company to the customer. The ITRON Smart Meters come equipped with this capability, and therefore, there are no additional costs to implement this capability.

F. AMI IMPLEMENTATION TIMELINE

1. System Wide Roll-Out

A chart showing the Company's proposed AMI implementation timeline is provided as Appendix G. The timeline includes a smart meter deployment schedule that begins with a 5,000 smart meter acceptance roll out in 2014 followed by ramp up to 90,000 meters by year end 2015.

A full scale deployment of 9,000 meters per month will begin in the first quarter of 2016. The Company anticipates that it will complete full deployment of its smart meters by the end of 2020. In its Initial Smart Meter Filing, Duquesne Light noted that it was premature to develop a final system-wide deployment schedule given the substantial tasks that the Company was undertaking to: (1) assess needs, and (2) select technology, a vendor, software, hardware and other smart meter components. Therefore, the Company noted its intent to meet the 15 year deployment schedule set forth in the Commission's *Implementation Order*. See Duquesne Light Initial Smart Meter Plan, pp. 36-37. The Company did provide an initial estimated date of December 31, 2018 for full system roll out of smart meters. However, the Company explained that this date was not final and that the Company would provide a detailed description of its plans for full system-wide roll out of smart meter technology as part of its Final Smart Meter Plan. See Duquesne Light Initial Smart Meter Plan, p. 37.

In the Commission's Order approving the Company's Smart Meter Plan, the Commission noted that Duquesne Light had provided an approximate date of December 31, 2018 to complete system-wide deployment of smart meters. The Commission further noted that Duquesne Light had explained that the dates were approximate and that it was the Company's intent to meet the 15 year deployment schedule provided by Act 129. *Petition of Duquesne Light Company for Approval of Smart Meter Technology Procurement and Installation Plan*, Docket No. M-2009-2123948, Order entered May 11, 2010, p. 27.

The Company is extending full deployment of smart meters to allow for the two-year ramp-up period described above. This ramp-up period will give the Company time to test systems and functions before implementing technology on a system-wide basis. The Company believes that this is a prudent and reasonable approach and that it will mitigate the risk of technology glitches that could create a negative experience for customers.

In addition to the ramp-up period, Duquesne Light is proposing a phased functional implementation of Smart Meter features starting with the most basic capabilities such as monthly billing from smart meter usage data and ending with the most advanced capabilities such as automatic control of electric consumption. This phased functional implementation is designed to

allow the market for many of the advanced smart meter capabilities to become more mature, which will then provide a better definition of the requirements. Requirements that are not fully defined result in rework, which ultimately results in additional costs for customers. Duquesne Light believes that this potential rework and associated costs can be avoided by our proposed phased functional implementation approach.

At the same time, however, the Company anticipates that much of the functionality throughout deployment will be valuable. The Company will integrate available functionality, to the extent it has been fully tested and accepted throughout the process, into business practices where possible. This will allow the Company to take advantage of the benefits early in the process. For example, the Company plans to integrate hourly data into its processes used for daily reconciliation and PJM settlements. Similarly, the Company plans to implement the remote connect / disconnect functionality in select areas as it become available. This extension of the phased-in approach of smart meter functionality throughout the deployment will ensure implementation obstacles are removed throughout the entire process rather than defer until the last stage of deployment. The Company and customers will be able to take advantage of the benefits of AMI as deployed throughout the service area.

The following table provides a high-level overview of Duquesne Light's proposed phased functional implementation approach by requirement.

Duquesne Final SMIP Plan

Type	Requirement	2014	2015	2016	2017
Basic	Commissioning and decommissioning of smart meters in the field	x			
Basic	Collection of usage data for billing and events such as tamper alarms	x			
Basic	Monthly billing from smart meter usage data	x			
Basic	Manual disconnects and reconnects	x			
ACT 129	Bi-directional data communications	x			
ACT 129	Record usage data on at least an hourly basis once per day	x			
ACT 129	Provide direct access to and use of price and consumption information				x
ACT 129	Provide customers with information on their hourly consumption		x		
ACT 129	Enable time-of-use (TOU) rates and real-time price (RTP) programs		x		
ACT 129	Automatic control of the customer's electric consumption				x
PA PUC	Remote disconnects and reconnects			x	
PA PUC	Provide 15-minute or shorter interval data			x	
PA PUC	On-board meter storage that comply with national standards	x			
PA PUC	Open standards and protocols	x			
PA PUC	Upgradable capabilities	x			
PA PUC	Voltage monitoring				x
PA PUC	Remote reprogramming of the meter	x			
PA PUC	Outages and restorations				x
PA PUC	Net metering of customer generators		x		

2. New Construction And Customer Requests

Pursuant to Act 129 and the Commission's *Implementation Order*, EDCs are required to deploy smart meter technology at the end of the 30-month grace period in new construction and upon customer request. As part of Duquesne Light's grace period planning efforts, the Company has designed interim solutions to comply with these deployments outside of the Company's planned smart meter deployment schedule since the AMI project will not start until the Final Smart Meter Plan is approved.

a. New Construction

Duquesne Light installs approximately 2,000 meters annually in new construction sites throughout its service territory. At the end of the grace period, Duquesne Light plans to install ITRON smart meters at all new residential construction sites and communicate with these meters through its existing AMR ITRON Fixed Network system. These meters will be transitioned to the new AMI system at the time that the new communication network is extended to these locations as part of the full deployment schedule. Smart meters that communicate through the AMR system will provide daily reads until they are transitioned to the AMI system at which time they will provide hourly reads and AMI functionality that is available at that time. The transition from the AMR system to the AMI system will be determined by the Duquesne Smart Meter Program full deployment schedule. Duquesne Light will continue to deploy Alpha meters that communicate through its existing AMR ITRON MV-90 system for all new commercial and industrial ("C&I") construction sites until the new communication network is extended to these locations as part of the full deployment schedule.

b. Customer Requests

Since the enactment of Act 129 smart meter legislation in 2008, Duquesne Light has only received a few customer requests for a smart meter. To honor customer requests for direct access to un-validated usage data after the grace period, Duquesne Light plans to install ITRON smart meters that communicate with its existing AMR ITRON Fixed Network system for billing purposes but enable HAN connectivity through ZigBee for direct access purposes. To honor customer requests for next day access to validated hourly usage data through a web portal, Duquesne Light plans to install Alpha meters (currently used on C&I accounts) and communicate with them through its existing AMR ITRON MV-90 system for both billing and next day usage data access purposes. After the Smart Meter Program Final Smart Meter Plan is approved by the Commission, Duquesne Light will purchase, implement and integrate the ITRON Head-End Data Collection Engine with the MDM. Once this work is complete, Duquesne Light will install ITRON smart meters for all customer requests and communicate with them directly via a public cellular network. This solution is projected to be available during the smart meter deployment ramp-up period and will be utilized until the new communication

network is extended to these locations as part of the full deployment schedule. Customers that request a smart meter outside of the Company's full deployment schedule will be charged the incremental communication and deployment costs but not the cost for the meter. The Company will develop a fee for this scope and update Rule 14.2 of its tariff.

G. SMART METER PROGRAM COSTS

The total cost of Duquesne's Smart Meter Program is estimated at $238 million spent over an 11 year period beginning in 2010 and ending in 2020. The following table provides a breakdown of the total Smart Meter Program estimated costs by scope component and operating versus capital expenditures.

Cost Estimates ($ millions)	Total
Smart Meter Program Planning	3.0
FOCUS Project	35.0
AMI Project Vendor Components (ITRON)	97.5
AMI Project Communication Network (WAN)	8.0
AMI Project IT Systems including PMO	63.4
AMI Project Customer Acceptance	3.1
AMI Project Contingency	28.0
Total	$238.0

The Smart Meter Program planning costs encompass all of the grace period expenditures necessary to develop the Final Smart Meter Plan. A significant portion of these planning costs are the engagement of third party subject matter expertise such as SAIC, IBM and other

consulting resources. These planning costs also include the technology proof of concept with ITRON to prove the viability of the proposed AMI system solution.

The FOCUS Project costs encompass all of the IT system costs necessary to replace Duquesne Light's CIS and implement a new MDM. These IT system costs include software and hardware purchases and maintenance during the grace period; outside services involved in the implementation and integration of CC&B and MDM; and an allocation of other ancillary project expenditures such as facilities, training, organizational change management and installation of supporting IT products.

The AMI Project Vendor Component costs encompass all of the equipment and services being provided by ITRON as described in Section C of this Plan. These cost estimates are based on the contract negotiations that have been conducted to date between Duquesne Light and ITRON. These negotiations are expected to conclude in the third quarter of 2012 with a completed contract that can be executed upon Commission approval of the Company's Final Smart Meter Plan.

The AMI Project WAN costs encompass all of the equipment and services described in Section C.4 of this Plan. These cost estimates are based on analysis, including preliminary propagation studies, conducted by Duquesne Light and ITRON with the assistance of SAIC.

The AMI Project IT Systems costs encompass all of the implementation and integration services described in Section D of this Plan. In some instances where it is cost justified, the third party delivery services may be replaced with the purchase of additional software and hardware products. These cost estimates are based on analysis conducted by Duquesne Light with the assistance of IBM.

The IT Systems costs also encompass the responsibilities of the PMO which includes third party SI resources as well as the following seven Duquesne Light internal resources which are all incremental to the Company's current staffing levels:

- AMI Program Manager (1)

- AMI IT Systems Coordinator and IT Systems Analyst (2)
- AMI Metering Coordinator and Metering Engineer (2)
- AMI Communication Network Coordinator and Telecom Engineer (2)

The AMI Project Customer Acceptance costs encompass all of the work efforts described in Section I of this Plan. These cost estimates are based on analysis conducted by Duquesne Light with the assistance of Customer Performance Group ("CPG").

The AMI Project contingency costs encompass industry standard funding reserves for third party services as well as specific funding reserves for areas of the program where meter deployment, communication protocol, and security appliance decisions still need to be finalized based on emerging or evolving additional information.

A further breakdown of the estimated costs for the FOCUS and AMI projects by year is provided in Appendix H.

H. SMART METER COST RECOVERY

In its Initial Smart Meter Plan the Company proposed to recover its costs to implement smart meter technology via a Section 1307 Smart Meter Charge. By order dated May 11, 2010, the Commission approved Duquesne Light's Initial Plan with certain modifications. In addition, the Commission approved the Company's SMC, with certain modifications, which provides for full and current cost recovery of smart meter costs. The first SMC was implemented effective August 1, 2010.

The SMC uses a formula to calculate the revenue requirement for the quarter for each component. The SMC is updated quarterly, effective January 1, April 1, July 1 and October 1 each year. Common costs are then allocated to the revenue requirement for each meter type based on the number of each type of meter. A description of the SMC is provided in Rider No. 20, Smart Meter Charge, of the Company's retail tariff.

The formula to compute the revenue requirement for single phase, three-phase and common plant each includes four primary components. The first component is the pre-tax return on average projected net plant in-service ("PIS") for the upcoming quarter. Net PIS includes eligible smart meter plant and supporting systems adjusted for accumulated depreciation and accumulated deferred income taxes associated with that plant. The second component of the revenue requirement includes the projected expenses for depreciation, operation and maintenance for the upcoming quarter. The third component is an adjustment to the revenue requirement made for expected operating cost savings, if any, realized by the Company by implementing smart meter technology. The fourth component is a reconciliation adjustment, developed through an annual filing, to reconcile for the actual revenue requirement for the previous reconciliation year versus the billed revenue for the same period.

The revenue billed under the SMC for each quarter of the reconciliation period is compared to the actual revenue requirement calculated for each quarter using actual data for each of the four components of the formula. The over or under collection of revenue is recouped or refunded as appropriate with interest over a one year period beginning on January 1 of the following year. All over and under recovery calculations include interest at the legal rate of 6%.

The Company is proposing to recover the costs for implementing its Final Smart Meter Plan through its existing SMC without modification.

I. CUSTOMER EDUCATION AND ACCEPTANCE STRATEGY

1. Introduction

In early 2011, Duquesne Light engaged Customer Performance Group (CPG) to assist the company with development of a strategy that minimizes the risk of customer resistence to smart meter technology that many utilities throughout the country have previously experienced. CPG has worked with several utilities in California, Nevada and Illinois to successfully deploy smart meters in a manner that increases customer awareness, understanding and confidence with the new AMI technologies. A primary component of the customer confidence model is the communication of AMI technology benefits to customers soon after they receive their new smart meter.

As part of our planning efforts with CPG, we identified several new enhanced products and services such as Bill-to-Date reporting, Usage threshold alerts, Usage graphs, TOU rates, RTP programs and HAN offerings that are all facilitated by leveraging the investment in AMI technologies. Duquesne Light will offer select, cost-effective enhanced products and services for our customers that also provide transactional benefits to the company. These services are signed to increase customer participation and acceptance of smart meter technology. Additionally, The CPG deployment approach also strives to minimize customer inconvenience and provide a neutral, if not positive overall customer experience related to smart meters.

2. Target Audiences

Duquesne Light's three primary target audiences are employees, stakeholders and customers. A description of these three audiences and their relationships to smart meter technology is below:

Audience	Role
Employees	
• **Installers**	Installers install the smart meters. They have customer contact prior to installation and when the work is completed.
• **Field Liaison**	The field liaison is a person skilled in energy audits who accompanies the installers to provide door-to-door outreach to customers and troubleshoot customer complaints.
• **Call Center**	The call center provides customers information and education regarding smart meters and processes customer complaints and claims.
• **Other**	All other employees serve as ambassadors who can explain the smart meter system to family, friends, and neighbors.
Stakeholders	
• **Elected Officials and Staff**	Elected officials and their staffs are a source of information about the smart metering system for constituents and a channel for receiving customer complaints.
• **Community Leaders**	Community leaders include political organizations, special-interest organizations, business organizations, service organizations, faith-based organizations, and schools. They act as third-party communicators to customers.
• **Media**	Media includes representatives of newspapers, television, and radio who communicate with customers.
• **Electric Generation Suppliers (EGS)**	EGS's are the retailers who sell the electric commodity to customers and may develop new products and services based upon the smart metering system.
• **Curtailment**	CSPs provide energy and demand response products to

Service Providers (CSPs)	encourage customers to curtail usage at times of peak load.
• **Service Providers**	Service providers include contractors, electricians, aggregators, and others who act on behalf of customers and provide information to customers about electric appliances and services.
• **Union Leaders**	Union leaders are the representatives of DLC employees who are represented under collective bargaining agreements. They act as third-party communicators to employees.
Customers	
• **Residential**	Residential customers include customers who live in single-family and multi-family premises who take service on rates RS, RH, and RA.
• **Commercial and Industrial (C&I)**	C&I customers include those who take service on rates GS/GM and GMH.

3. 90-60-30 Day Communication Strategy

Duquesne Light's CEA plan focuses on the creation of a neutral-to-positive customer experience. The foundation of this customer experience is the 90-60-30 day strategy. 90-60-30 refers to the number of days prior to installing a smart meter during which specific information, education, and customer experience tactics are implemented.

90 Days. At least 90 days before installing smart meters in a specific community or geography, Duquesne Light will:

1. Establish a website that contains information about the smart meter system.
2. Continue to educate employees about the smart meter system and its deployment.
3. Continue to educate stakeholders about the smart meter system and deployment.

Duquesne Light's approach for employees will be to provide information and education so that all employees can act as advocates for the smart meter system. To achieve this objective, Duquesne Light will use a variety of methods to build employee awareness and understanding. These methods include:

- Town hall meetings
- Training classes
- Internal newsletters
- Office signage
- Employee intranet
- Involving employees in testing smart meter products and services

For front-line employees, Duquesne Light will employ additional educational methods that teach specific skills associated with the employee's job role. This may include advanced training classes for call center representatives, field liaisons, and installers, and daily briefings for field liaisons and installers.

Duquesne Light's approach for stakeholder education will be one of personalized meetings, group presentations, and events (such as stakeholder collaboratives). Duquesne Light will support these activities with collateral materials, props, videos, and demonstrations of smart meter services.

60 Days. Approximately 60 days before deploying smart meters in a specific region, Duquesne Light will conduct outreach events and presentations for both residential and business community members. The media Duquesne Light plans to use for community outreach includes PowerPoint presentations, trade show-style booths, and a mobile display (similar to other mobile smart meter/grid displays used by utilities, such as Oncor's Mobile Experience Center and Reliant Energy's Smart Home Solutions recreational vehicle). The likely venues for these outreach presentations include community groups (Chambers of Commerce, Rotary, citizens' councils, political groups), homeowners' associations, and community events (street fairs, farmers' markets, and athletic events). Content presented during these events will focus on features and benefits, function (how the system works), and confidence (accuracy, security, privacy, health, and value). To increase participation in these community presentations, Duquesne Light may use paid and non-paid media to generate interest and awareness.

30 Days. Thirty days before installing a smart meter at a customer's premises, Duquesne Light will implement a targeted direct media campaign. The first element is a direct mail letter which informs customers of the forthcoming smart meter installation. It also provides the customer information about the function, benefits, and confidence associated with the smart metering system. All communication materials will include Duquesne Light's call center website address and phone number for additional information

Three days before deploying meters at a customer's premises, customers will receive an automated phone call and/or email reminding them of the smart meter installation. This communication will provide customers as precise a time as possible for when the meter will be installed.

At the time of installation, installers will perform the installation according to a customer experience script (knock, explain, install, and leave record of work). A Duquesne Light field liaison will be available to provide immediate, on-call support to customers or, when not otherwise engaged, door-to-door outreach.

Five days after installation Duquesne Light will survey a sample of customers regarding installation satisfaction and their attitudes toward the smart metering system (as compared to the baseline survey).

Thirty five days after installation, customers who have signed up for Duquesne Light's My Account service or otherwise provided Duquesne Light an email address will receive a notification that their smart meter services (bill-to-date, bill alerts, projected bill, and hourly usage data) are now available to them online.

4. Measuring Success

The measure of success for a smart meter deployment project is a neutral-to-positive customer experience. Duquesne Light will measure the success of its customer experience and education efforts through three specific methods.

First, prior to launching the CEA plan, Duquesne Light will conduct focus group tests to ensure that the approach, themes, messages, media, and methods meet customer requirements. Additionally, Duquesne Light will administer a baseline survey that gathers customer attitudes toward the smart meter system prior to implementation. This baseline survey will enable Duquesne Light to then determine the impact of the CEA plan on consumer attitudes.

Second, after implementing the 90-60-30 strategy, Duquesne Light will track the:

- Number of website visits it receives
- Number of calls it receives from customers
- Classification of those calls in appropriate categories such as complaints, claims, high bill, and opt out.

Subsequent analysis of the volume and type of these calls will enable the Duquesne Light to maintain or adjust its customer experience, customer education, and customer support efforts. Additionally, Duquesne Light will collect customer feedback during outreach presentations regarding customer attitudes toward the smart meter system.

Third, five days after the installation of smart meters, Duquesne Light will survey a sample of customers regarding their satisfaction with the installation experience. Analysts will integrate the survey results into a weekly dashboard report for Duquesne Light. This report will guide Duquesne Light in taking appropriate action to correct deficiencies in the customer experience.

J. RISK MITIGATION STRATEGIES

Duquesne's Smart Meter Program is a multi-year, multi-million dollar endeavor that will greatly impact several key stakeholders including our customers and employees. Therefore, a large part of the grace period planning effort has been spent identifying program risks as well as developing strategies for mitigating the impact of these risks. Duquesne's risk mitigation strategies include:

- Engaging Industry Subject Matter Expertise throughout the planning effort
- Commissioning an AMI Technology Proof of Concept (POC)

- Instituting a ramp-up period along with a phased functional implementation within the Smart Meter Program deployment schedule
- Development of a Customer Acceptance Strategy aligned with the PA PUC Retail Market Investigation (RMI) Directives
- Engagement of an experienced Systems Integrator to own the end-to-end integration between the FOCUS and AMI projects

Industry Subject Matter Expertise

As a first step in our Smart Meter Program planning effort, Duquesne issued a Request for Proposal (RFP) in order to obtain the services of a utility industry advisor with extensive planning experience for AMI technology projects. R.W. Beck, Inc. (now SAIC) was selected for this advisory role and assisted Duquesne with our milestone flings as well as with our AMI vendor RFP process and AMI communication network extended analysis. Duquesne has also engaged industry subject matter expertise during our contract negotiations with ITRON. Eckert Seamans is providing external legal counsel while IBM is providing contract assistance from a business risk assessment perspective. IBM was also engaged to provide Duquesne with "lessons learned" from other Smart Meter Programs where they have served as the Systems Integrator as well as to assist Duquesne with developing our systems integration cost estimates for the AMI project. Finally, Customer Performance Group (CPG) is assisting Duquesne with development of a customer acceptance strategy designed to minimize the risk of customer backlash against smart meters that other utilities throughout the country have previously experienced.

AMI Technology Proof of Concept

In the latter half of 2011, Duquesne entered into a one year contract with ITRON to conduct an AMI Technology Proof of Concept (POC). This POC enables Duquesne to test the various components of the AMI System outlined in section IV of this plan. The POC is designed to validate the following data.

- Meter configurations/settings
- Captured interval data using ITRON AMI Service Test

- Captured event messages/alerts/alarms in the ITRON OpenWay Collection Engine
- Firmware download using the ITRON OpenWay Collection Engine
- On demand reads; remote disconnects and reconnects using ITRON AMI Service Test

In addition to testing the ITRON OpenWay components of Duquesne's proposed AMI System, this POC will also test various AMI communication network solutions. The scope of the POC is 36 residential meters and 16 commercial meters. These meters are installed in a dual-socket environment so that the customer's existing meter is still used for production billing purposes. The POC local area network (LAN) consists of four cell collectors and two range extenders. The POC wide area network (WAN) utilizes various private wireless solutions for intermediate transmittal to Duquesne owned communication towers as well as public wireless solutions for direct connect functionality. As part of the POC, Duquesne is also performing laboratory tests on several Home Area Network (HAN) devices. These devices include:

- Two Smart Thermostats
- Two In-Home Displays (IHDs)
- Two Load Control Devices

Ramp-up Period and Phased Functional Implementation

In order to minimize the risk of any potential unforeseen technology glitches having a mass negative impact on our customers, Duquesne is proposing a ramp-up period for Smart Meter deployments. This period will begin with a 5,000 smart meter acceptance roll-out in the latter half of 2014 followed by a gradual build-up to a full deployment of 9,000 meters per month by the end of 2015. In addition to the ramp-up period, Duquesne is proposing a phased functional implementation of Smart Meter features starting with the most basic capabilities such as monthly billing from smart meter usage data and ending with the most advanced capabilities such as support for Home Area Networks. This phased functional implementation is designed to allow the market for many of the advanced smart meter capabilities to become more mature, which will then provide a better definition of the requirements.

Customer Acceptance Strategy

In early 2011, Duquesne engaged Customer Performance Group (CPG) to assist the company with development of a strategy that minimizes the risk of customer backlash against smart meters that many utilities throughout the country have previously experienced. CPG has worked with several utilities in California, Nevada and Illinois to successfully deploy smart meters in a manner that increases customer awareness, understanding and confidence with the new AMI technologies. Duquesne Light's Customer Acceptance Strategy is explained in more detail in Section I above.

System Integrator

As explained in Section D above, Duquesne's Smart Meter Program has four levels of complex systems integration that must work both independently as well as in conjunction with each other in order for the entire solution to function properly. The Company believes that the success of our AMI project is highly dependent on engaging an SI that has utility industry experience with both AMI technology projects as well as with Oracle Utility Application Suite implementations.

IV. CONCLUSION

As explained herein, during the Grace Period, Duquesne Light has been implementing billing system and information technology changes that are necessary to provide customers with Smart Meter Technology. In addition, Duquesne Light has been carefully and thoroughly investigating ways to meet the Act 129 Smart Meter Technology requirements. Duquesne Light's Final Smart Meter Plan will provide all of the smart meter capabilities required under Act 129 and the Commission's *Implementation Order* to customers in a cost-effective manner.

Tab

A

ITRON Smart Meter Characteristics

Duquesne Light smart meters will include the following features:

- Integrated 900 MHz communication radio
- Support of the capability for 15-minute interval meter reads (Scheduled and unscheduled)
- Delivered, received and net registers within the meter
- Consumption measurements including delivered and received kWh, kW demand, kVAh, kVARh, and average RMS voltage.
- Available interval lengths of 15, 30, and 60 minutes.
- Support creation and storage of interval consumption data records in at least eight (8) independent meter data sequences for polyphase meters and four (4) sequences for single phase meters.
- Support TOU rate programming (4 independent TOU registers)
- Outage and voltage monitoring/ alarms
- Addressability and security utilizing multiple standards-based communication options
- Upgradable firmware via the network
- Equipped with a ZigBee based interface to Home Area Network (HAN) devices, load control devices, and smart thermostats, providing Duquesne with in-premise load control
- The HAN interface supports IEEE 802.15.4 with AES 128 bit encryption
- Certified compliant with the ZigBee SEP supporting open standards and interoperability
- Single phase meters will have an internal 200 Amp service switch to support remote disconnect and demand limiting
- Tamper detection
- ANSI C12.1, C12.19, C12.20 and C12.22 standards
- At least 45 days of data storage
- Support of more than one meter manufacturer
- Net Metering

These meters support the following AMI standards:

- ANSI C12.1 – 2001 Code for Electricity Meters
- ANSI C12.10 – 2004 Watt-hour Meters
- ANSI C12.18 – 2006 Protocol Specification for ANSI Type 2 Optical Port
- ANSI C12.19 – 1997 DLC Industry End Device Data Tables
- ANSI C12.20 – 2002 Electricity Meters – 0.2 and 0.5 Accuracy Class
- NEMA SG-AMI 1–2009 Requirements for AMI Meter Upgradeability
- IEEE C65.42 Recommended Practice on Surge Testing for Equipment

	Connected to Low Voltage (1000V & Less) AC Power Circuits
• ANSI C12.22	Protocol for Interfacing to Data Communication Networks

Tab

B

Bill to Date and Projected Bill

Service Category	Bill
Classification	AMI Project
Channel(s)	Web
Source	Internal or 3rd party vendor
Author	Peter Honebein
Owner	Kellie Simon and Pam Niehaus
SMEs	Peter Honebein
Created	August 22, 2011
Last Modified	October 13, 2011

Description

The Bill-to-Date and Projected Bill feature displays the following information to customers on the DLC website:

- Number of days in the billing cycle
- Estimated bill-to-date, in dollars
- Projected bill, in dollars, with an estimated range.

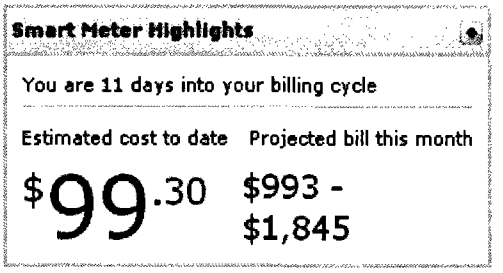


Figure 1: Example of the feature (Source: Aclara). Data shown in example is for illustration purposes only.

User Requirements

1. The customer shall be able to view bill-to-date through a secure, self-service web interface.
    A. The website shall display the bill-to-date feature on the customer's online account home page.
        I. The bill-to-date feature shall display the number of days in the billing cycle.
        II. The bill-to-date feature shall display the estimated cost to date.
            a. The estimated cost to date should display the name of the customer's Electric Generation Supplier (EGS).
            b. The estimated cost to date should display the distribution costs and the supply costs as separate line items.
        III. The bill-to-date feature shall display the projected bill for the billing cycle.
            a. The projected bill shall present a low-high range.
            b. The projected bill range shall decrease as the number of days in the billing cycle increases.
            c. The projected bill should display the distribution costs and the supply costs as separate line items.
        IV. The bill-to-date feature must be updated with the prior day's usage data by 12pm.

V. The bill-to-date feature shall be displayed esthetically following generally accepted graphic design principles.
VI. The customer shall be able to identify the bill-to-date feature on their account's homepage.
a. The customer shall be able to interpret the information contained within the bill-to-date feature.

B. The customer shall be able to display help information that explains the bill-to-date feature.
I. The help information shall explain how the estimated cost is calculated.
II. The help information shall explain how the projected bill range is determined.

2. The FOCUS system shall display the bill-to-date information on the customer's record.
A. A CSR shall be able to access a customer's bill-to-date information in less than five seconds.
B. A CSR shall be able to state to the customer their bill-to-date information.

Future Scope (not included in AMI Project)

- Add Mobile and IVR channels

Tab

C

Bill Alerts

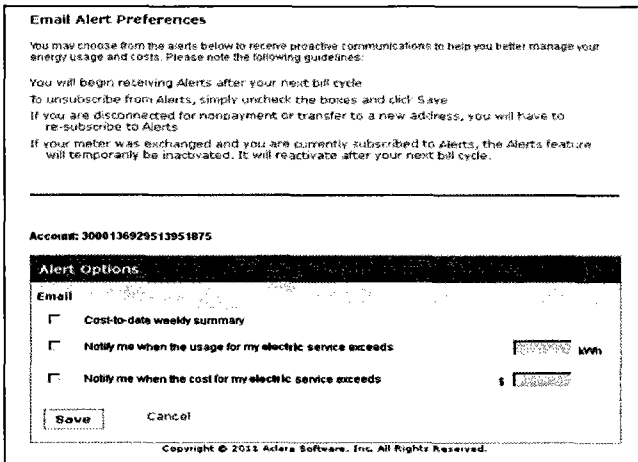
Service Category	High Bill
Classification	AMI Project
Channel(s)	CSR, Web, Phone, E-mail, Text
Source	Internal or 3rd Party
Target Audience	RS, RH, RA, GS/GM
Author	Peter Honebein
Owner	Residential and C&I Customer, Customer Care; Kellie Simon, Pam Niehaus
SMEs	Lynda Pekarsky, Kellie Simon, Pam Niehaus
Created	October 11, 2011
Last Modified	October 14, 2011

Description

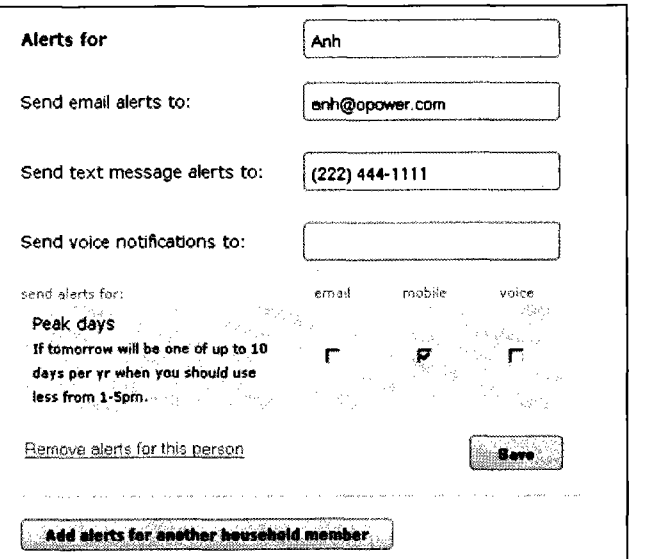
A bill alert is a phone, e-mail, or text notification sent by DLC to a customer (residential or commercial) under these conditions:

- At a specified time, as defined by the customer
- When usage (in kWh) exceeds a specific threshold, as specified by the customer
- When cost (in $) exceeds a specific threshold, as specified by the customer
- When demand (kW) exceeds a specific threshold, as specified by the customer (future feature)
- When Power Factor (PF) exceeds a specific threshold, as specified by the customer (future feature)

First generation bill alerts are set by customers in a self-service fashion through their utility's My Account website. Below are examples of two user interfaces for setting alerts.

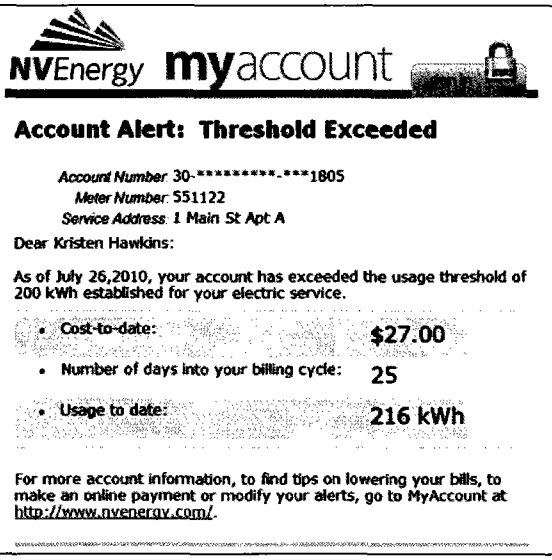


Alert options provided by the October 2011 version of Aclara's Bill Alert service. Notice how the design accommodates future types of alerts.



Alert options provided by a 2010 version of Opower's Peak Day and High Price Alert service. Note how this service allows alerts to be set for other household members. Additionally, notice how the design accommodates future types of alerts.

Alerts are generated automatically by the system when one or more of the conditions set by the customer are met. Alerts are sent via the communication channel the customer specified. Below are examples of e-mail alerts.



NVEnergy myaccount

Account Alert: Threshold Exceeded

Account Number: 30-*********-***1805
Meter Number: 551122
Service Address: 1 Main St Apt A

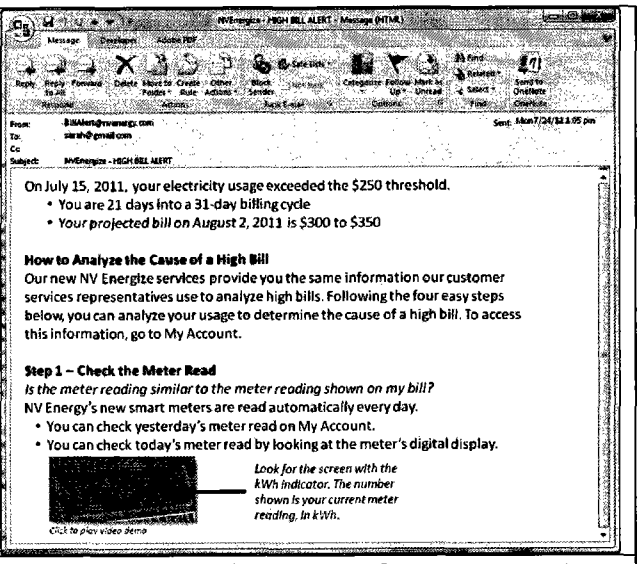
Dear Kristen Hawkins:

As of July 26,2010, your account has exceeded the usage threshold of 200 kWh established for your electric service.

- Cost-to-date: $27.00
- Number of days into your billing cycle: 25
- Usage to date: 216 kWh

For more account information, to find tips on lowering your bills, to make an online payment or modify your alerts, go to MyAccount at http://www.nvenergy.com/.

Example bill alert email as generated by Aclara's Bill Alert service (2011).



On July 15, 2011, your electricity usage exceeded the $250 threshold.
- You are 21 days into a 31-day billing cycle
- *Your projected bill on August 2, 2011 is $300 to $350*

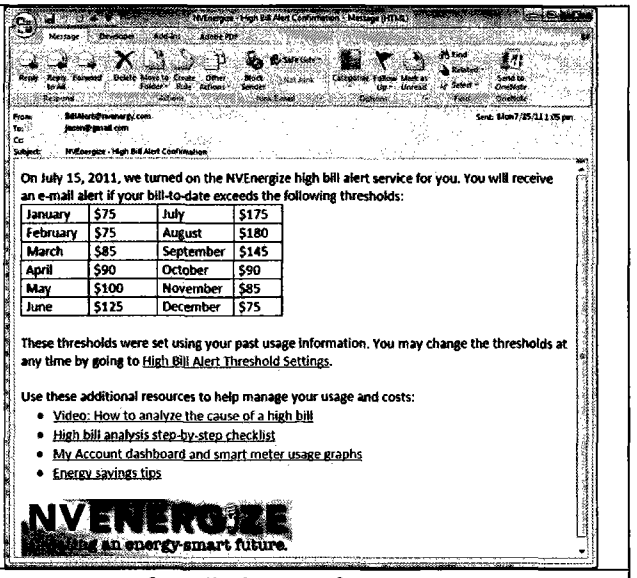
How to Analyze the Cause of a High Bill
Our new NV Energize services provide you the same information our customer services representatives use to analyze high bills. Following the four easy steps below, you can analyze your usage to determine the cause of a high bill. To access this information, go to My Account.

Step 1 – Check the Meter Read
Is the meter reading similar to the meter reading shown on my bill?
NV Energy's new smart meters are read automatically every day.
- You can check yesterday's meter read on My Account.
- You can check today's meter read by looking at the meter's digital display.

Look for the screen with the kWh indicator. The number shown is your current meter reading, in kWh.

Prototype bill alert based upon focus group review that includes high bill analysis instructions (2011).

Since DLC CSRs should be able to set up bill alerts for customers as part of starting service, high bill analysis, payment arrangement, and so on, customers should receive confirmations when their notification preferences are changed (either by the customer or DLC). An example confirmation is below:



On July 15, 2011, we turned on the NVEnergize high bill alert service for you. You will receive an e-mail alert if your bill-to-date exceeds the following thresholds:

January	$75	July	$175
February	$75	August	$180
March	$85	September	$145
April	$90	October	$90
May	$100	November	$85
June	$125	December	$75

These thresholds were set using your past usage information. You may change the thresholds at any time by going to High Bill Alert Threshold Settings.

Use these additional resources to help manage your usage and costs:
- Video: How to analyze the cause of a high bill
- High bill analysis step-by-step checklist
- My Account dashboard and smart meter usage graphs
- Energy savings tips

NVENERGIZE
an energy-smart future.

Prototype of a Bill Alert confirmation.

Second generation bill alerts should be integrated into existing services and transactions. For example, if a customer starts new service, bill alerts should be a default part of that service. If a customer wants to establish a payment arrangement, the bill alerts should be a default part of that service.

User Requirements

1. The customer shall be able to manage bill alerts through a secure, self-service web interface.
    A. The customer shall be able to view customer education regarding the bill alert feature.
    B. The customer shall be able to turn bill alerts on and off.
        I. The customer shall be able to choose a discontiguous array of bill alerts types (weekly, kWh, dollars).
            a. The customer shall be able to choose a discontiguous array of media channels (phone, email, text) through which to receive bill alerts.
        II. The customer shall be able to specify alternative email addresses and telephone numbers for receiving alerts.
        III. The customer should be able to designate other people (family members, relatives, roommates) who should receive alerts.
    C. The customer shall be able to set timing for bill alerts.
        I. The customer shall be able to set a time frequency (day, week, bi-weekly) that would trigger a bill alert.
        II. The customer shall be able to set kWh threshold(s) that would trigger a bill alert.
            a. The customer should be able to set kWh thresholds for each month.
            b. The system should suggest default kWh thresholds for each month.
                i. The system should be able to populate kWh thresholds for each month automatically based upon the historical usage at the customer's premise.
                    1. The customer should be able to select the year used by the system to select usage data.
            c. The customer should be able to modify kWh thresholds for each month.
                i. The customer should be able to modify kWh thresholds individually.
                ii. The customer should be able to adjust kWh thresholds globally, through a percentage increase or decrease.
        III. The customer shall be able to set dollar threshold(s) that would trigger a bill alert.
            a. The customer should be able to set dollar threshold(s) for each month.
            b. The system should suggest default values for each month.
                i. The system should be able to populate dollar thresholds for each month automatically based upon the historical usage at the customer's premise.
                    1. The customer should be able to select the year used by the system to select usage data.
            c. The customer should be able to modify dollar thresholds for each month.
                i. The customer should be able to modify dollar thresholds individually.
                ii. The customer should be able to adjust dollar thresholds globally, through a fixed percentage increase or decrease.
    D. The customer should be able to view a list of past bill alerts online.

I. The list should include phone, email, and text bill alerts.
II. The customer should be able to view the bill alert message associated with a bill alert.
III. The customer should be able to export the list of bill alerts to an Excel or tab-delimited text file.

2. DLC CSRs shall be able to manage bill alerts for customers.
   A. The system that DLC CSRs use shall provide the same functionality as provided to customers (as described above).
   B. DLC CSRs shall be able to email customers additional information about bill alerts.
   C. DLC CSRs shall be able to explain bill alerts to customers.
      I. DLC CSRs shall be able to configure bill alerts to customers.
3. The system shall send the customer an email confirmation when the customer's bill alert settings are modified within two minutes of the modification.
   A. DLC should be able edit confirmation messages.
   B. The email shall include text, graphics, and URL links
      I. The customer shall be able to click a link in a bill alert email to access information related to that link.
         a. The email shall include a link to the bill alert modification screen.
         b. The email should include links to related DLC services.
      II. The email shall mask personal identifiable information.
      III. The email shall contain information about the modifications made.
      IV. Customers shall not be able to reply to an email.
4. The system shall send the customer a bill alert by 12pm when a bill alert condition is "true".
   A. Alerts shall be sent between the hours of 9am and 7pm
   B. The system shall determine if a bill alert condition is "true" daily.
      I. A bill alert shall reflect usage for the prior day
      II. A bill alert shall reflect dollars for the prior day
   C. Each bill alert type (weekly, kWh, dollars) shall have its own unique message.
      I. Each bill alert media (phone, e-mail, text) shall have its own unique message.
         a. The message shall be able to display dynamic content such as bill-to-date, usage-to-date, projected monthly bill, number of days into bill cycle, and threshold value.
         b. The message should display the name of the customer's Electric Generation Supplier (EGS).
            i. The message should show the distribution costs and the supply costs as separate line items.
         c. DLC should be able to edit bill alert messages.
         d. Email alerts shall include text, graphics, and URL links.
            i. The customer shall be able to click a link in a bill alert email to access information related to that link.
               1. The email shall include a link to the bill alert modification screen.
               2. The email should include links to related DLC services.
         e. Customers shall not be able to reply to a bill alert email.
         f. Bill alert messages shall mask personal identifiable information.
5. The system shall be able to generate a results report for confirmations and/or alerts for any given time period.

A. The report should provide summary statistics regarding the total number of customers eligible to receive alerts, the number of customers receiving bill alerts, the type of alert, and the type of alert media.
    I. The customer should be able filter the report by various criteria, such as rate class.
B. The report should include number of messages sent.
C. The report should include number of messages returned as undeliverable.
    I. The report should list the specific customer accounts that had undeliverable messages.
    II. The system should generate a letter not notify customers regarding their undeliverable alerts.
D. The report should include success and/or failure percentages.
E. The report should include the number (by type) of click-throughs for links included in on the bill alert.

Future Scope (not included in AMI Project)

- Add notifications/alerts for demand and power factor.

Tab

D

Smart Meter Usage Data Display

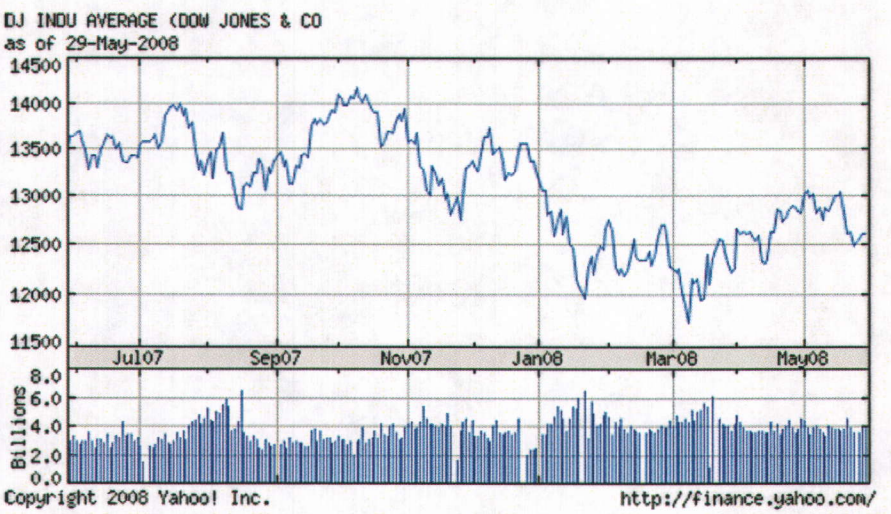
Service Category	Information - Usage
Classification	AMI Project
Channel(s)	Web
Source	Internal and 3rd Party
Target Audience	RS, RH, RA, GS/GM
Author	Peter Honebein
Owner	IT
SMEs	Peter Honebein, Kellie Simon, Pam Niehaus, Lynda Pekarsky
Created	October 15, 2011
Last Modified	October 20, 2011

Description

Smart meters collect usage data in 60-, 30-, or 15-minute increments. This data, along with the cost, pricing, and temperature information associated with that data, can be used by CSRs and customers to perform these important tasks:

- Discover the causes of high energy usage
- Discover the costs associated with high energy usage
- Analyze the causes of a high bill
- Determine whether one is effectively shifting usage to other times of the day.

The primary method of presenting this data and information to customers is through smart meter usage graphs. These graphs typically present bar or line charts of usage and costs. Here are some influences and examples:

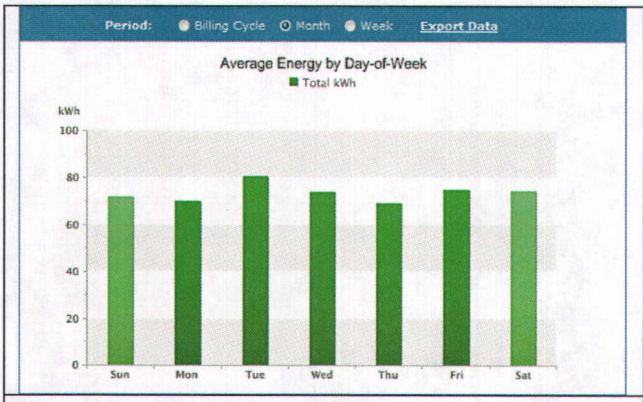


Early customer research using customer co-design panels suggest that smart meter usage graphs could be modeled after Yahoo stock market charts. These types of charts provide a very flexible user experience as users can:

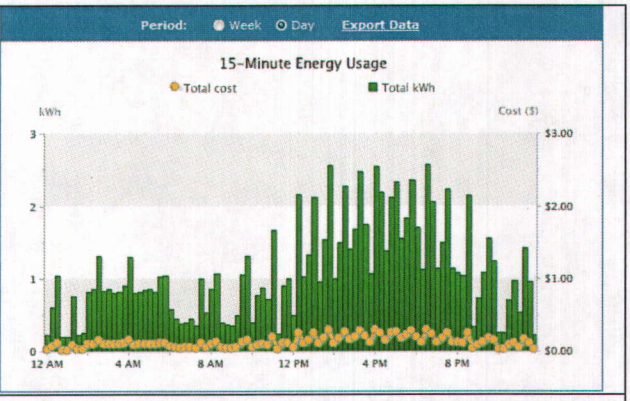
- Specify a time range of any length

- Overlay comparisons
- Zoom, pan, and scroll
- Visualize goals and targets

Most first generation smart meter usage graphs do not offer the level of flexibility as illustrated in the above Yahoo stock chart. Time ranges are typically in fixed increments (day, week, month, billing cycle, year). Zoom, pan, and scroll are not supported, and comparisons are limited. For example:



The Average Energy by Day-of-Week graph from Aclara (2011).



The 15-minute Energy Usage graph from Aclara (2011).

The usage/billing rate graph from Opower (2010). Note that this graph illustrates the portion of the daily usage/costs at specific real-time prices.

User Requirements

1. The smart meter data displayed in the smart meter usage graphs shall reflect information up to 11:59pm the prior day.
    A. The data shall be available for display by 12pm the next day.
        I. Example: Data from October 19, 12am to 11:59pm is available for display by 12pm October 20.
2. A customer shall access smart meter usage graphs through a secure online web browser.

3. A DLC CSR shall access smart meter usage graphs for a customer's account through a secure online browser.
    A. A DLC CSR shall be able to use the graphs to analyze high bills.
    B. A DLC CSR shall be able to explain the graphs to a customer.
4. A customer whose account is associated with one or more premises or one or more meters shall be able to select the premise or meter they want to view.
5. The system shall display interval usage, cost, temperature, and rate data in a graph.
    A. The customer should be able to choose the type of graph.
        I. The graph could be a bar chart.
        II. The graph could be a line chart.
        III. The graph could be a pie chart.
        IV. The graph could be an area chart.
        V. The graph could be a combination (e.g. line and bar, similar to Yahoo financial charts).
    B. The customer should be able to choose a graph based upon task/purpose (e.g. high bill analysis).
    C. The customer shall be able to specify the type of usage and cost data in the graph.
        I. A type of usage and cost data shall be actual.
        II. A type of usage and cost data shall be cumulative.
        III. A type of usage and cost data shall be average.
        IV. A type of usage and cost data shall be by rate period (e.g. on-peak and off-peak)
    D. The customer shall be able to specify the time period to display in the graph.
        I. The time period shall include common time designations.
            a. A designation should be by year(s)
            b. A designation should be by month(s)
            c. A designation should be by billing cycle(s)
            d. A designation should be by week(s)
            e. A designation should be by day(s)
            f. A designation should be by hour(s)
            g. A designation shall be by interval(s) (if less than 60 minutes)
        II. The time period shall be a range of MM/DD/YY, HH:MM to MM/DD/YY, HH:MM.
            a. The customer shall be able to set the time period.
        III. The graph should allow the customer to scroll forward or backward in time.
        IV. The graph should allow the customer to zoom in and zoom out.
    E. The customer shall be able to specify the data to display in the graph.
        I. The data shall be usage, in kWh.
        II. The data should be demand, in kW
        III. The data should be power factor.
        IV. The data shall be cost, in dollars and cents per kWh.
        V. The data shall be temperature, in Fahrenheit or Celsius.
    F. The customer shall be able to hover the cursor over an element in the graph to display a tool-tip containing information about the element.
        I. Tool-tip should contain the date the element represents.
        II. Tool-tip should contain the time the element represents.
        III. Tool-tip should display the usage the element represents, in kWh.
        IV. Tool-tip should display the usage the element represents, in kW.
        V. Tool-tip should display the usage the element represents, in Power Factor.
        VI. The tool tip should display the cost the element represents, in dollars and cents.

VII. The tooltip should display the temperature the elements represents.

G. The customer should be able to double click a data element in a graph (e.g. bar, line, pie slice) to zoom into the data represented by that element.
    I. The customer shall be able to navigate back to the prior view in one mouse click.

H. The customer should be able to include comparisons in the graphs.
    I. A comparison should be meters or premises associated with the account.
    II. A comparison should be one time period compared with another time period.
    III. A comparison should be cost for one time period compared with another time period.
    IV. A comparison should be average cost for kWh.
    V. A comparison should be a savings goal (e.g. 5% reduction).
    VI. A comparison should be a load shape.
    VII. A comparison should be temperature.
    VIII. A comparison should be similar homes or businesses.
        a. The comparison could be based on premise type.
        b. The comparison could be based on NAICS code.

6. The customer shall be able to export an Excel or tab-delimited file containing the data associated with the displayed graph.
7. The customer should be able to copy a graph to the clipboard.

Future Scope (not included in AMI Project)

- None.

Tab

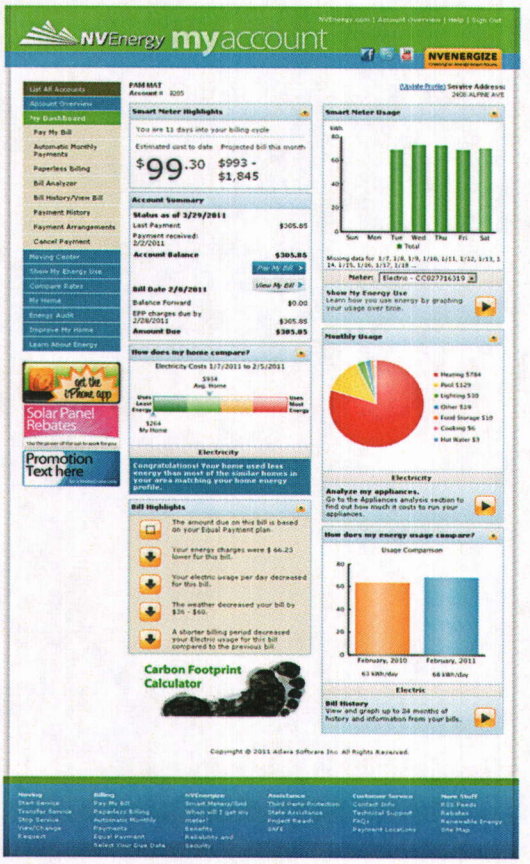
E

Web Dashboard

Service Category	Information - Usage
Classification	AMI Project
Channel(s)	Web
Source	Internal or 3rd Party
Target Audience	RS, RH, RA, GS/GM
Author	Peter Honebein
Owner	IT
SMEs	Peter Honebein, Kellie Simon, Pam Niehaus, Lynda Pekarsky
Created	October 15, 2011
Last Modified	October 20, 2011

Description

A web dashboard is a screen that displays a summary of the customer's account. The dashboard is typically comprised of a number of configurable components or "gadgets" that display or summarize the customer's bill, usage, comparisons, and so on. Other gadgets perform analyses and task, such as an energy audit or a rate comparison. An example dashboard is shown below.



User Requirements

1. The dashboard shall display information up to 11:59pm the prior day.
    A. The data shall be available for display by 12pm the next day.
        I. *Example: Data from October 19, 12am to 11:59pm is available for display by 12pm October 20.*
2. The web dashboard shall be part of Duquesne's corporate website.
    A. The web dashboard shall have a look and feel that aligns with Duquesne's corporate website.
3. The customer shall log in with a username and password to access the dashboard.
    A. The customer should be able to set up accounts for family members, roommates, and so on so that they can access the dashboard.
        I. The dashboard should provide access control that enables the customer to limit what other authorized persons can see and access on the dashboard.
4. The dashboard shall display a collection of gadgets.
    A. A gadget shall be bill-to-date.
    B. A gadget shall be smart meter usage graphs.
        I. The customer shall be able to view the smart meter graphs (*See Smart Meter Usage Graphs feature description*)
    C. A gadget shall be shadow bill.
        I. The customer shall be able to view the shadow bill for a given bill cycle (*See Dynamic Rates and Shadow Bill feature description*)
    D. A gadget shall be account summary.
        I. The customer shall be able to manage their account information.
            a. The customer shall be able to edit their complete customer profile.
                i. The customer profile shall include tax status.
        II. The gadget could display bill aging information.
        III. The gadget could display payment arrangement information.
        IV. The gadget could display a bill breakdown pie chart (e.g. show percentages of each bill component: supply, distribution, taxes, etc.)
    E. A gadget shall be alert/notifications.
        I. The customer shall be able to configure and reconfigure alerts and notifications (*See Bill Alert feature description*)
    F. A gadget shall be web how-to's.
        I. The customer shall be able to view a list of how-to topics.
            a. The user should be able to sort the list of topics.
            b. The user should be able to filter the list of topics.
            c. The customer shall be able to view a specific how-to topic in html and/or .pdf.
    G. A gadget shall be bill history.
        I. The customer shall be able to view a list of past bills from the last two years.
            a. The list should be a table that displays summary data for each bill, such as meter read, kWh, supply cost, distribution cost, and so on.
                i. The customer should be able to print the list.
            b. The customer shall be able to display a .pdf copy of a bill.
                i. The customer shall be able to print a copy of the bill.

c. The customer could display a bill breakdown pie chart (e.g. show percentages of each bill component: supply, distribution, taxes, etc.).

H. A gadget shall be bill inserts.
   I. The customer shall be able to view a list of bill inserts.
      a. The customer shall be able to display a .pdf copy of a bill insert.
I. A gadget should be event log.
   I. The customer should be able to view a list of events (e.g. notifications and alerts).
      a. The customer should be able to view the content of the event message (*See Bill Alert feature description*)
J. A gadget shall be appointments (*See Appointments feature description*)
   I. The customer should be able to view a list of appointments
      a. The customer should be able to view the details of an appointment.
         i. The customer should be able to modify or cancel an appointment.
K. A gadget shall be energy audit.
L. A gadget shall be rate comparison.
M. A gadget should be home (or business) comparison.
N. A gadget should be daily and monthly usage.
O. A gadget should be bill highlights.
P. A gadget should be usage comparison (e.g. month this year compared to month last year).
Q. A gadget should be CAP status.
   I. The gadget should display CAP deficiency amount to date
   II. The gadget should display date of anticipated recertification (show also as percentage).
   III. The gadget should display CAP Frozen Arrearage amount written off and amount left to write off and number of on-time payments still needed to write off remainder of frozen arrearage balance.

5. The dashboard shall have a default layout of gadgets.
   A. The customer (or user) should be able to customize the dashboard for their username.
      I. The customer should be able to hide and show gadgets.
      II. The customer should be able to arrange gadgets.
      III. Changes to the dashboard shall persist from one login to the next.
6. The customer shall be able to access help regarding gadgets and their elements.
   A. The customer should be able to hover the cursor over any gadget or element to display a tool-tip containing information, tips, or education about the gadget or element.
   B. The customer shall be able to display online help information for a specific gadget.
7. The dashboard should display banner ads related to DLC programs and services.

Future Scope (not included in AMI Project)

- None.

Tab

F

Roles and Responsibilities (RACI Matrix)

The proposed Smart Meter Program RACI Matrix provides a high-level view of accountability, responsibility, and consultation requirements for the various services provided by the SI.

The RACI relies upon the following definitions of accountability:

- (R) Responsible: Those who do the work to achieve the task. There is typically one role with a participation type of responsible, although others can be delegated to assist in the work required.
- (A) Accountable: The one ultimately answerable for the correct and thorough completion of the deliverable or task, and the one from whom responsible is delegated the work. In other words, an accountable must sign off (approve) on work that responsible provides. There must be only one accountable specified for each task or deliverable.
- (C) Consulted: Those, whose opinions are sought, typically subject matter experts.
- (I) Informed: Those who are kept up-to-date on progress, often only on completion of the task or deliverable - one-way communication.

Activity	SI	PMO	IT	Business	Vendor
Project Management Office					
Project Governance	R	A	C	C	I
Program management plan	R	A	C	C	I
System integration planning, oversight and coordination	R	A	C	C	C
Change and communication planning, oversight and coordination	C	A,R	C	C	C
Program and AMI Project status	R	A	C	C	C
AMI Project Scope management	R	A	C	C	C
Program risk and dependency management	R	A	C	C	C
Design authority (technical and business process)	R	A	C	C	C
Program Quality Assurance	R	A	C	C	C
Program Cost tracking	C	R	C	C	C

Activity	SI	PMO	IT	Business	Vendor
Vendor Management (Itron, Oracle, WAN)					
Measure and monitor vendor performance	A,R	C	I	I	C
Vendor status	A	I	I	I	R
Vendor scope management	R	C	C	A	R
Vendor risk and dependency management	R	C	C	A	R
Maintenance and oversight of Vendor SLAs	A,R	C	I	I	R
Organizational Change Management					
Organizational Change Management Plan	R	A	I	C	I
Communication Plan	R	A	I	C	I
Stakeholder engagement & management	C	A	I	R	I
Organizational & Site Readiness	R	A	I	R	I
Change impact of to-be business process	R	I	I	A,R	C
Change management and communications execution	R	A	I	C	I
Training					
Training needs assessment	R	I	C	C,A	C
Training strategy	R	A	I	C	C
Train the trainer	C	I	C	A	R
End user training management	C	I	C	R	C
Courseware customization & development	C	I	C	A	R
Conduct Training	C	I	C	R	C

Activity	SI	PMO	IT	Business	Vendor
Deployment Planning					
Develop meter deployment processes	C	I	C	C,A	R
Develop WAN deployment processes	C	I	C	C,A	R
Deployment planning	C	A	C	C	R
Deployment coordination and management	R	A	C	C	C
Business Process Design & Requirements					
Conduct workshops	R	I	I	C	C
Process modeling methodology and toolset	R	I	C	C,A	I
Develop to-be process models	R	I	C	C,A	C
Develop process narratives	R	I	A	C	C
Develop test scripts	R	I	A	C	C
Identify SMEs and stakeholders	C	I	C	R,A	I
Identify, track, and validate functional requirements	R	I	I	C,A	C
Identify, track, and validate technical requirements	R	I	C	C,A	C
OBIEE Business Analytics and Reports					
Design and document reports	R	I	C	C,A	C
Build reports	R	I	C	A	C

Activity	SI	PMO	IT	Business	Vendor
Solution Design & Integration					
Head-end Integration					
Install head-end	C	I	C	A	R
Configure head-end	C	I	C	A	R
Integrate head-end to MDMS	R	I	C	A	C
Portal					
Design and document portal	C	I	R	A	C
Build portal	C	I	R	A	C
Integrate portal	C	I	R	A	C
FOCUS Configurations and Extensions for AMI					
Conceptual systems architecture	R	I	A	C	C
Data architecture	R	I	A	C	C
Design and document configurations and extensions	R	I	A	C	C
Implement configuration changes required to enable AMI	C	I	A,R	C	C
Build Configurations and extensions	R	I	A	C	C
Oracle Fusion/SOA Service Inventory					
Conceptual systems architecture	R	I	A	C	C
Data architecture	R	I	A	C	C
Develop integration architecture and strategy	R	I	A	C	C
Design and document services	R	I	A	C	C

Build services	R	I	A	C	C
Activity	SI	PMO	IT	Business	Vendor
Solution Design & Integration					
Environments					
Develop environment strategy	R	I	A,C	I	C
Develop environment specs (hw, os, system sw)	R	I	A,C	I	C
Procurement	I	I	A,R	I	I
Installation and configuration	C	I	A,R	I	I
Security Solution and Design					
Identify security requirements	R	I	I	C,A	C
Develop recommendations for To Be state of AMS solution	R	I	A	C	C
Configure security applicable security components	R	I	A	C	C
Support of Integration, E2E and UAT testing for security components	R	I	A,R	A	C

Activity	SI	PMO	IT	Business	Vendor
Solution Testing					
Document test strategy, including defect management	R	I	C	A	C
Document test plan	R	I	C	A	C
Develop test data	C	I	C	A,R	C
Design, perform, and record results of unit test	R	I	C	A	R
Design, perform, and record results of string test	R	I	C	A	R
Design, perform, and record results of vendor package test (factory accep	C	I	C	A	R
Design, perform, and record results of system test	R	I	C	A	R
Design, perform, and record results of end to end test	R	I	C	A	R
Design, perform, and record results of high availability test	R	I	C	A	R
Design, perform, and record results of performance test	R	I	C	A	R
Design, perform, and record results of acceptance test	C	I	C	A,R	C
Design, perform, and record results of operability test	C	I	C	A,R	C
AMI Project - Production Support					
Implementation, trasition, and rollout plan	R	A	C	C	C
Data QA/QC	C	I	C	R,A	C
Migration to new system	C	C	R	A	C
System rollout	C	C	R	A	C
Production and transition support	R	I	I	A	C

Duquesne Light Final Smart Meter Plan Appendix F

Project Management Office

Scope

The Program Management Office ("PMO") will be responsible for overall program management and governance. The PMO will oversee projects and activities for which it has delivery responsibility, i.e., FOCUS Project and the AMI Project. This document assumes that the FOCUS Project has its own governance and the PMO's role is to integrate the delivery of the FOCUS Project in its consideration for AMI Project deployment.

System Integrator Roles and Responsibilities

The RACI Model in Section 1.7 Roles & Responsibilities defines at a high level the areas of responsibility for a Systems Integrator ("SI") in connection with the Program Management functions for the Smart Meter Program and the AMI Project. In addition the following activities or assumptions are included:

- Leveraging existing DLC processes, the System Integrator will establish PMO governance processes and procedures and manage the day-to-day activities of the program and the AMI Project
- The SI will manage the System Integrator team resources, and have oversight of the vendor resources to achieve their scopes and responsibilities.
- The SI, via the PMO, will provide change control, scope management (at the program and workstream levels) as well as risk and dependency management
- The PMO will be responsible for cost tracking and quality assurance/quality control

DLC Roles & Responsibilities

The RACI Model in the Roles & Responsibilities section defines at a high level the areas of responsibility for DLC in connection with the Program Management functions for the Smart Meter Program and the AMI Project. In addition the following should be noted:

- DLC retains accountability with its stakeholders and the Board of Directors for leadership and oversight of the Smart Meter Program, and DLC resource and activity management
- DLC will also select and provide the appropriate project management tools to enable PMO productivity and functionality, e.g., SharePoint
- DLC will sign off on PMO processes and procedures when established

Vendor Management

Scope

The nature of a Smart Meter Program and the application footprint introduces a significant number of vendors that must work together to achieve the goals of the program. The scope of the vendor management services is to coordinate and oversee delivery of the participating vendors and their activities throughout the lifecycle. It is anticipated that separate vendors may be engaged for the following: Oracle solution (including MDMS), AMI Head End, Smart Meters, Network Infrastructure, and Home Area Networking. Some of the oversight is performed through the program management office, this function provides for assessing vendor performance, scope management and risk and dependency management.

System Integrator Responsibilities

- SI will be the primary interface for scope and dependency management for the contracts required to deliver the Smart Meter Program. For purposes of the scope and estimated costs, it is assumed that the SI will interface and manage up to 3 vendors.
- SI is responsible for overseeing inter-vendor interfaces and procedures, implementation planning and execution, and alignment of vendor technology roadmaps
- The System Integrator will also be responsible for maintenance, reporting and oversight of defined SLA's for vendors where contracts include SLAs.
- SI is responsible for review of design documentation and management of issue resolution. The System Integrator will also be responsible for maintenance and oversight of defined SLA criteria.

DLC Responsibilities

- DLC will select vendors and negotiate contracts, as required, with each vendor. The scope of services assumes no effort is included for vendor contract negotiation by the SI.
- DLC will define vendor specific service level agreement ("SLA") criteria and validate that measurement processes exist.

Organizational Change Management& Training

Scope

The Organizational Change Management &Training scope defines the project's impact on the organization and stakeholders, and outlines the change management and training required to support successful program delivery.

- **Change Program Strategy and Management:** Sets the transformational change strategy and agenda, measures change impacts, and provides management of the change program
- **Communication:** Increases awareness and knowledge of the project and its impact through communication channels
- **Stakeholder Engagement &Management:** Manages and measures understanding, expectations, and commitment of stakeholders through the life of the project
- **Change Impact:** Understanding the impacts of the business process changes in the solution design and working with the training team and business process team to enable DLC for the change ahead.
- **Organization & Site Readiness:** Prepares the organization for change, which includes measuring and identifying risk areas of organizational, stakeholder, and site readiness for change
- **Training:** Understanding the training required to support the deployment and enabling a Train-the-Trainer model to deliver end user training.
- **Transition:** The overlap of AMR and AMI may require some additional materials to be created to for the communications and training efforts

System Integrator Roles and Responsibilities

Within the Organizational Change Management & Training function, the System Integrator will co-lead these activities with Duquesne Light, leveraging the work performed under the FOCUS Project.

DLC Roles and Responsibilities

- DLC will be responsible to manage DLC resources through identified changes and sign off on organizational readiness deliverables.
- DLC will collaborate with the Systems Integrator on training development and be responsible for end user training delivery.

Deployment Planning

Scope

The Deployment Planning work stream focuses on activities required to complete AMI meter deployment including the selection of deployment vendor(s), the establishment of vendor and DLC meter deployment processes and technology that reliably scales for full AMI meter deployments, coordination of AMI meter deployment activities with vendor led AMI network deployment and the establishment of AMI deployment SLAs.

System Integrator Roles and Responsibilities

Within the Deployment planning, the System Integrator will work with the AMI meter deployment vendor(s) to complete the following activities:

- AMI Meter Deployment schedule development in coordination with vendor-led network deployment
- AMI Pre-deployment preparation
- Complete systems integration necessary to support 3rd party meter deployment
- Define the AMI deployment RACI for vendor led and DLC led deployment activities
- Develop on-boarding materials for the AMI deployment vendor staff
- Develop transition management processes and sequencing for the deployment period
- Develop approach for mapping internal controls and quality assurance metrics and processes for AMI field deployment
- Identify and help resolve AMI meter deployment issues

DLC Roles and Responsibilities

DLC will select meter deployment and AMI network vendors, sign off on the AMI meter and network deployment schedule and RACI, define SLA measurement criteria and complete procurement activities to provide adequate inventory availability in adherence to the AMI deployment schedule.

Business Process Design& Requirements

Scope

The Business Process Design (BPD) work stream focuses on the business process planning, scoping, analysis and documentation necessary to support the design, build, test and implementation of the AMI solution and associated processes within the DLC organization.

The Business Process work stream will be responsible for delivering the AMI To-Be business process models (URMs), process narratives, and business requirements. (Level 4 process flows are included in the assumptions) This team will also be responsible for creating test scripts required to perform the end to end system testing as well as requirements for creating and / or updating Standard Operating Procedures.

The System Integrator should provide accelerators such as industry standard use cases and process maps (to enable URM development), common industry requirements and common industry process definitions to facilitate the definition of DLCAMI implementation requirements.

For purposes of this estimate, the solution assumes the development/refinement of 60-80 end-to-end business processes associated with the AMI Project. Examples of selected processes to be defined by this team include:

- AMI deployment vendor controls processes
- Integration of AMI vendor led installation &configuration processes to DLC meter installation and configuration processes as appropriate
- AMI Meter Lifecycle Management processes
- Management and Recovery of the AMI system including AMI network management & monitoring processes
- Call center processes to support AMI meter deployment and billing from AMI meters
- Processes for deployment and management of HANs

System Integrator Roles and Responsibilities

System Integrator will lead the transition from the FOCUS project artifacts to new AMR application footprint including URMs, interface inventory items, revised data maps (if any) and functionality matrix requirements.

System Integrator will drive analysis, definition and documentation of the to-be processes in the groups listed above for each of the two releases. The documented processes and associated validated functional and technical requirements will be delivered to the appropriate dependent work streams for use in the design, build, test and implementation of system and process changes required to support the AMI Program Release requirements.

DLC Roles and Responsibilities

DLC will be responsible to provide SMEs who will participate in the completion of the documentation of the functional and non-functional requirements for the AM system through participation in SI led workshops, multiple reviews of work products resulting from the workshops and review and sign off of functional specifications documentation.

OBIEE Business Analytics& Reporting

Scope

The introduction of Smart Meters brings with it new sources of data and information from the field regarding meter and network operations as well as information on customer usage and consumption patterns. The System Integrator will leverage DLC's existing OBIEE platform delivered as part of the FOCUS Project to enable processing of the newly introduced data and information which will provide more value from Smart Meter and Smart Grid investments over time. This defined scope of work assumes that existing data stores will be used to develop analytics and reporting requirements.

System Integrator Responsibilities

The System Integrator will be responsible for developing up to fifty (50), low complexity OBIEE Business Analytics reports and dashboards to process, monitor and manage Smart Meter data for releases one and two including:

- Load Profiling
- Demand Response Program Evaluation
- Event Tracking and Trending Modeling
- New Rate Programs
- Data Collection Analysis

New dashboards and reports may also be developed during the releases of the AMI implementation and will be dependent on the finalized scope of each release.

DLC Responsibilities

DLC will review and approve dashboards and reports and will be responsible for data cleansing and integrity of the data in OBIEE.

Solution Design and Integration

Head-end Integration

Scope and Objective

This scope includes the planning, design and implementation effort for the installation of the AMI Head-end component. This includes vendor management of configuration of the Head-end, construction of the interfaces between FOCUS-AMI solution components and Head-end, and testing of the developed interfaces. The scope includes the configuration, integration, and testing of any intermediate security appliances. Head End implementation services are grouped into: infrastructure, IT architecture, interfaces, and testing. The infrastructure services for the Head-end include determining the sizing and specifications for the physical platforms. The IT architecture for the Head-end includes finalizing the application, data, integration and security components of the architecture.

System Integrator Roles and Responsibilities

The System Integrator will work with the Head-End vendor to define:

- Head-End implementation schedule and milestones
- Non-Functional Requirements and Infrastructure Specifications
- Head End functionality
- Detailed interface specification and design

The System Integrator will oversee the Head-End vendor activities to maintain the AMI program schedule:

- Interface Development by the Head End vendor to and from the MDMS, DLC enterprise IT applications, HAN integration and integration to monitoring tools
- Interface and Head-end Configuration testing including management of defect resolution

DLC Roles & Responsibilities

- Review and approve environments requirements. Procure, install, configure, and stabilize the physical environments.
- Review, comment, and approve the application, security, integration and data architecture
- Review, comment, and approve functional and technical detail design of interfaces
- Conduct Factory Acceptance Testing for the Head-End software
- Review, comment, and approve test strategies
- Lead efforts to resolve vendor-related head-end issues

Portal Integration

Scope and Objective

This scope provides for the planning, design and implementation effort for the development of new portal functionality to support AMI, which will allow customers to view their consumption data. This includes configuration of portal functions, construction of the interfaces between AMI solution components and the portal, and testing of portal functionality and the developed interfaces. The scope of this work stream includes the configuration, integration, and testing of any intermediate security appliances.

The Portal implementation services include IT Architecture, interfaces, and testing, which will extend existing portal functionality.

System Integrator Roles and Responsibilities

The System Integrator will:

- Architect, design and implement the portal components to support role-based access to data and business functions for employees (AMI Operational staff), business partners and customers.
- Validate that user experience is seamless between the current portal capabilities and future capabilities that are enabled in support of the AMI Project.
- Define Portal implementation schedule and milestones
- Define Non-Functional Requirements and Infrastructure Specifications
- Define Portal functionality
- Define detailed interface specification and design
- Interface Development to and from the Portal, monitoring tools, and data sources
- Interface and Portal Configuration testing including management of defect resolution

DLC Roles and Responsibilities

- Review and approve environments requirements.
- Procure, install, configure, and stabilize the physical environments
- Review, comment, and approve the application, security, integration and data architecture
- Review, comment, and approve functional and technical detail design of interfaces
- Design the role based approach to data access
- Lead efforts to resolve vendor-related issues
- Code and test customer portal applications

FOCUS Configuration and Extensions for AMI

Scope and Objective

This scope estimates the FOCUS Application footprint changes to enable AMI Project as a result of newly introduced AMI business processes and requirements. Based upon our discussion, the estimate of scope includes 10 medium extensions with minimal configuration changes will be required to enable the footprint for AMI. The lifecycle of extensions include analysis, detailed design, development / configuration and testing. Upon completion of these steps, extensions are assumed to be incorporated in regular implementation planning steps e.g., system testing, integration testing, UAT.

System Integrator Roles and Responsibilities

- Architect, design and implement the FOCUS extensions to support AMI-enabled functionality.
- Define FOCUS modification implementation schedule and milestones
- Define non-functional requirements and infrastructure specifications
- Define functionality
- Define detailed interface specification and design
- Interface Development to and from FOCUS
- Interface and FOCUS enhancement testing including management of defect resolution

DLC Roles and Responsibilities

- Implement the configuration changes required to enable AMI functionality
- Review and approve environments requirements.
- Procure, install, configure, and stabilize the physical environments
- Review, comment, and approve the application, security, integration and data architecture
- Review, comment, and approve functional and technical detail design of interfaces and modifications
- Lead efforts to resolve vendor-related issues

Fusion/SOA AMI Service Inventory

Scope and Objective

System Integrator will architect, design and implement the Fusion/SOA based service inventory to enable system interoperability of DLC's systems in support of AMI business processes. This includes development of AMI enterprise integration and data architectures, high-level and detailed design, and implementation of identified AMI interfaces from the service bus to the destination application(s). Supporting documentation for each service in the inventory will also be delivered.

System Integrator Roles and Responsibilities

- Review and approve environments requirements.
- Oversee the procurement, installation and configuration of the physical environments
- Review, comment, and propose the application, security, integration and data architecture
- Review, comment, and propose functional and technical detail design of interfaces and modifications
- Lead efforts to assist in the resolution of vendor-related issues with the Fusion/SOA AMI Service Inventory

DLC Roles and Responsibilities

- Provide a part-time enterprise architect to validate the SI integration team understands CE imposed standards, styles, guidelines and tools with respect to design and development of the required SOA services and ETL transfers which comprise the AMI integrations
- Review and approve architecture and service designs.
- Procure, install, configure, and stabilize the physical environments
- Review and approve data architecture
- Review, comment, and approve functional and technical detail design of interfaces

Environments

Scope and Objective

AMI requires the building and maintenance of multiple IT hardware environments. This workstream involves determining the sizing and specifications for the physical platforms. This workstream involves identifying the appropriate architectural approaches and developing platform deployment strategies.

System Integrator Roles and Responsibilities

- Define the AMI Environments Strategy
- Work with MDMS, Head End, and Oracle vendors to identify environment and infrastructure requirements for each AMI component
- Define a consolidated environments and infrastructure requirements plan that addresses the needs of AMI software components
- Define sizing and specifications for the physical environments (excluding FOCUS which is assumed to be sized and appropriately designed to support AMI).
- Develop configuration management plan and strategy
- Lead and coordinate the implementation of configuration management of pre-production project environments
- Provide infrastructure support to implement infrastructure specifications
- Deliver non-production physical environment specifications
- Perform tasks associated with configuration management in pre-production project environments
- Perform software release and build tasks associated with the initial set up, scheduling and execution of build procedures and jobs in non-production environments
- Support DLC in managing and maintaining environments

DLC Roles and Responsibilities

- Review, comment, and approve the environment requirements, strategy and plan
- Procure, deploy, manage and maintain environments
- Review, comment, and approve configuration management and software release strategies.
- Provide configuration management tools for the hands on use of the System Integrator
- Manage moves and migrations to production environments
- Perform server and system administration responsibilities for environments

Security Solution Design

Scope and Objective

This section describes the architectural services that will be provided by the System Integrator team to define AMI solution's security infrastructure, and architecture. The introduction of Smart Meters introduces new security concerns to be addressed at the solution level.

The System Integrator will design and implement Security solution for AMI solution components within DLC firewall. The System Integrator will work with Head-end vendor to validate that vendor implements security from firewall to head end devices.

Details for the security scope and requirements are very nascent, and as such DLC should expect variability in the cost estimate depending upon the breadth of the solution discovered. Our estimate should enable baseline security controls but choices made during solution design may increase the level of effort and costs.

System Integrator Roles and Responsibilities

The System Integrator will:

- Work with DLC and AMI vendors to identify the security requirements and develop the AMI Security Roadmap, a sample of which is depicted in Figure 1 Sample Security Architecture Blueprint:

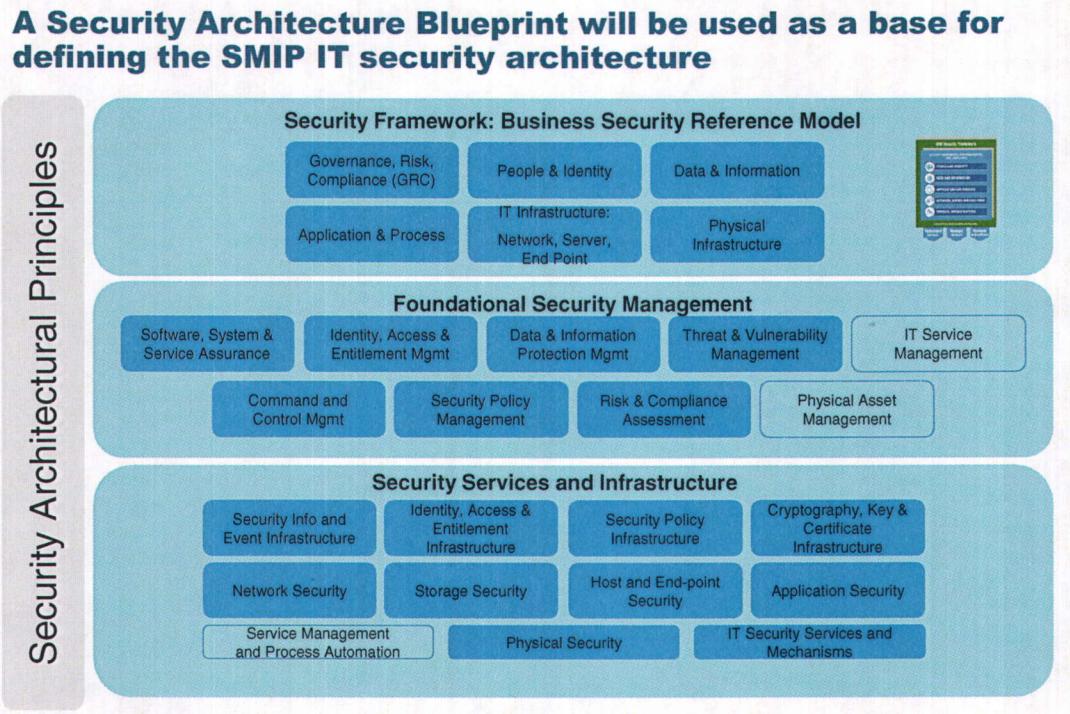


Figure 1 Sample Security Architecture Blueprint

- Plan to validate compliance with NISTR/ CIP and enterprise security policies
- The AMI Solution macro design including security architectures
- The AMI Solution micro design including security architectures
- The finalized security functionality the AMI Project
- The System Integrator lead the Security team to:
    - Architect, design and implement enterprise-grade identity and access control solution including single sign-on for employees, customers and business partners
    - Designs and implements solution to provide secure machine-to-machine interactions including meter communication to Head-end
    - Designs and implements solution for data privacy and data integrity for persisted data
    - Configure and test the security solution

DLC Roles and Responsibilities

- DLC will review and approve the AMI Security Solution macro and micro designs, as well as the finalized functionality for each release.
- Procure and install hardware and software components required to meet the final security solution design. Examples of costs not included are:
    - Hardware for Security appliances for data center and security software, e.g.,
    - Tivoli Access Manager for eBusiness (includes Tivoli Identity Manager)
    - Tivoli Federated Identity Manager users
    - Tivoli Security Policy Manager for Applications
    - WebSphere Register & Repository
    - MetaData Workbench (authorized user)

Solution Testing

Scope

The Testing work stream will cover the testing activities ranging from testing by AMI solution component (Meters, Communication Network, MDMS, Head-End, Portal, ODS, interfaces, security components) to testing in aggregation. Testing will validate the operation of AMI solution components working together while monitoring the individual components in an increasingly production-like environment.

System Integrator Responsibilities

- Development of the Smart Meter Program Master Test Strategy
- Development of system, integration, functional and technical test plans
- Solution and component-level functional and operational testing
- Development of system, integration and UAT test plans
- Unit testing of any components developed by the System Integrator
- Functional and technical test implementation
- Regression Testing
- Participation in DLC in execution of user acceptance testing
- Test & Defect Management

DLC Responsibilities

DLC will generally be responsible for oversight of the QA process, and active contribution and participation during the AMI user test phase:

- Review and approval of Smart Meter Test strategy and plans
- Contribution to AMI test cases, scenarios and data sets
- Execution of AMI user acceptance testing
- Procure and install hardware and software components required to support test management and execution, e.g., test planning, defect management, test development and execution and performance testing.

AMI Project - Production Support

Scope

System Integrator will support DLC's system operations for the first ninety days after AMI project go-live.

System Integrator Responsibilities

- Monitor system for needed enhancements
- Provide immediate assistance to critical issues and system downtime or failures
- Document and prioritize critical issues and enhancements for future AMI phases
- Communicate issues to vendors
- Work with DLC and vendors to assure timely releases of fixes
- Transition production support activities to DLC identified resource within 90 days

DLC Responsibilities

- Raise issues to System Integrator to resolve
- Monitor system for any anomalies or issues
- Coordinate multi-vendor issues
- Coordinate issue resolution requiring involvement of DLC departments
- Provide experienced permanent production support resources to work with System Integrator full-time during the 90 day System Integrator production support window.

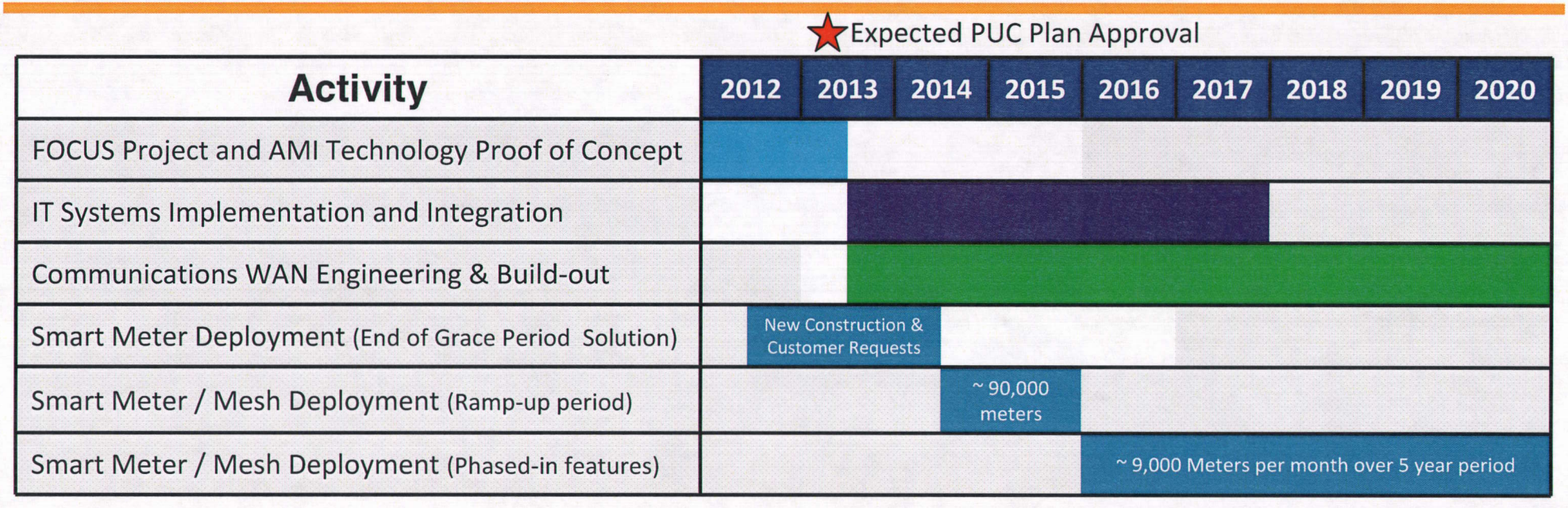
Tab

G

Duquesne Light Final Smart Meter Plan Appendix G

- AMI Implementation Schedule

Duquesne Light
Our Energy...Your Power



- DLC will select a System Integrator and negotiate a contract this year, subject to PUC approval of our Smart Meter Program. Upon plan approval, systems integration work and the detailed engineering work for the Communications WAN will commence.
- The build-out of the Communications WAN will be done in parallel with Smart Meter deployments
- Ramp-up deployment will include ITRON acceptance test of 5k meters in 2014 and then 85k in 2015
- IT systems work for base functionality will be completed in 2014 and advanced features will be phased-in from 2015 through 2017
- The full deployment of Smart Meters, with phased-in advanced features, will occur over a 5-year period starting in 2016 (9,000 meters per month or 108,000 meters per year)

Tab

H

Duquesne Light Final Smart Meter Plan Appendix H

Smart Meter Program ($ millions)	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	Total
Total Expenditures												
Smart Meter Program Planning	0.8	1.2	1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.0
FOCUS Project	2.7	11.2	13.5	7.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	35.0
AMI Vendor Components (ITRON)	0.0	0.0	0.0	3.0	4.2	12.8	15.1	15.6	15.6	15.6	15.6	97.5
Communication Network (WAN)	0.0	0.0	0.0	0.1	0.2	0.9	1.3	1.3	1.4	1.4	1.4	8.0
IT Systems including PMO	0.0	0.0	0.0	7.3	19.9	14.5	10.4	6.1	1.8	1.7	1.7	63.4
Customer Education & Acceptance	0.0	0.0	0.0	0.2	0.1	0.4	0.5	0.5	0.5	0.5	0.5	3.1
AMI Project Contingency	0.0	0.0	0.0	1.5	5.9	6.1	3.9	3.9	2.9	1.9	1.9	28.0
Total	$3.5	$12.4	$14.5	$19.7	$30.2	$34.8	$31.1	$27.4	$22.2	$21.1	$21.1	$238.0

TAB
2

Duquesne Light Statement No. 2

BEFORE THE
PENNSYLVANIA PUBLIC UTILITY COMMISSION

PETITION OF DUQUESNE LIGHT COMPANY
FOR APPROVAL OF ITS FINAL SMART METER PROCUREMENT AND
INSTALLATION PLAN

Docket Nos. P-2012-_____ and M-2009-2123948

Direct Testimony

Witness: William V. Pfrommer

Subject: Smart Meter Cost Recovery

Direct Testimony of William V. Pfrommer

I. INTRODUCTION

Q. Please state your full name and business address.

A. My name is William V. Pfrommer. My business address is 411 7th Avenue, Pittsburgh, PA 15219.

Q. By whom are you employed and in what capacity?

A. I am Manager, Rates & Tariff Services, for Duquesne Light Company ("Duquesne Light" or "Company").

Q. What are your qualifications, work experience and educational background?

A. I received a Bachelor of Science Degree in Mechanical Engineering from Grove City College in 1978 and a Masters in Business Administration from the University of Pittsburgh in 1989. I began my career at the Company in 1982 as a Project Engineer in the Engineering and Construction Division at the Beaver Valley Power Station. Over the last 30 years, I have held staff, supervisory and managerial positions in engineering, nuclear construction, customer technical services, marketing and rates. In my current role as Manager of Rates and Tariff Services, I am responsible for overseeing the Company's retail rates and wholesale transmission rates. In addition, it is my responsibility to ensure the rates are properly applied to customer bills. I am a licensed professional engineer in the Commonwealth of Pennsylvania.

Q. Have you previously testified before the Pennsylvania Public Utility Commission ("Commission") or other regulatory bodies?

A. Yes. I have testified on rate design matters before the Pennsylvania Public Utility Commission ("Commission") and Federal Energy Regulatory Commission ("FERC"). A list of proceedings in which I have submitted testimony is provided in Appendix A. Of note, I testified in the Company's Initial Smart Meter Filing proceeding at Docket No. M-2009-2123948.

Q. What is the purpose of your testimony?

A. The purpose of my testimony is three-fold. First, I will provide an overview of the Company's Smart Meter Cost Recovery Mechanism or Smart Meter Charge ("SMC"). Second, I will briefly summarize the level of costs that Duquesne Light anticipates it will recover through the SMC to implement its Final Smart Meter Procurement and Installation Plan ("Final Smart Meter Plan"). Additional cost detail is provided in the testimony of Duquesne Light's witness David Wolfe. Third, I will address issues related to customer requests for smart meters that would require Duquesne Light to install meters outside of its implementation schedule.

Q. **Are you sponsoring any exhibits?**

A. Not at this time.

II. COST RECOVERY MECHANISM

Q. **Does Act 129 provide guidance on how the costs of providing smart meter technology are to be recovered by the Company?**

A. Yes. Act 129 of 2008 ("Act") permits electric distribution companies ("EDCs") to fully recover the costs of providing smart meter technology, less operating and capital cost savings realized by the EDC. The Act permits EDCs to recover its allowable costs via a reconcilable surcharge consistent with 66 Pa. C.S. § 1307 ("Section 1307"), or in its base rates.

Q. Which cost recovery method was implemented by Duquesne Light?

A. Pursuant to the Implementation Order, *Smart Meter Procurement and Installation*, Docket No. M-2009-2092655, *Implementation Order* entered June 24, 2009 ("*Implementation Order*") issued by the Commission June 24, 2009, Duquesne Light petitioned the Commission for approval of its Initial Smart Meter Technology Procurement and Installation Plan ("Initial Smart Meter Plan") on August 14, 2009. In its Initial Smart Meter Plan the Company proposed to recover its costs to implement smart meter technology via a Section 1307 SMC. By order dated May 11, 2010, the Commission approved Duquesne Light's Initial Smart Meter Plan with certain modifications. In addition, the Commission approved the Company's SMC, with certain modifications, which provides for full and current cost recovery of smart meter costs. The first SMC was implemented effective August 1, 2010.

Q. Please describe the SMC as approved by the Commission.

A. The SMC recovers all eligible costs incurred by the Company to implement smart meter technology and the supporting infrastructure. The SMC is updated quarterly, effective January 1, April 1, July 1 and October 1 each year. Ten days prior to the beginning of each quarter, the Company submits a calculation of the monthly smart meter charge effective for the upcoming quarter. The fixed monthly charge is billed based on the type of meter installed at the customer premise.

Q. How does the Company assign and recover costs under the SMC?

A. The Company assigns cost based on three primary components of the Final Smart Meter Plan: a) single-phase meters, b) three-phase meters and c) common costs. The SMC uses a formula to calculate the revenue requirement for the quarter for each component. The revenue requirement associated with the common cost component is allocated to the revenue requirement for each meter type based on the quantity of each type of meter. An SMC is then derived for each meter type based on the revenue requirement for each meter type and the projected quantity of meters for the upcoming quarter.

A description of the SMC is provided in Rider No. 20, Smart Meter Charge, of the Company's retail tariff.

Q. Please explain the elements of the SMC formula as approved by the Commission to compute the quarterly revenue requirement for each component.

A. The formula to compute the revenue requirement includes four primary elements. The first element is the pre-tax return on average projected net plant in-service ("PIS") for the upcoming quarter. Net PIS includes eligible smart meter plant and supporting systems adjusted for accumulated depreciation and accumulated deferred income taxes associated with that plant.

The second element of the revenue requirement includes the projected expenses for depreciation, operation and maintenance for the upcoming quarter.

The third element is an adjustment to the revenue requirement made for expected operating cost savings, if any, realized by the Company by implementing smart meter technology.

The fourth element is a reconciliation adjustment, developed through an annual filing, to reconcile for the actual revenue requirement for the previous reconciliation year versus the billed revenue for the same period. The sum of these four items is the smart meter revenue requirement for the projected period.

Q. What depreciation rates does the Company apply under its SMC?

A. The Company applies a depreciable life of 15 years for smart meters to align with the 15 year depreciation period defined in the Act. The Company applies a depreciable life of 10 years for capital investment in common costs for the FOCUS and AMI systems. Common costs in general include infrastructure costs

such as meter data management, data storage and collection systems, networks and communication systems described by Mr. Wolfe.

Q. How does the Company reconcile costs under the SMC?

A. On or about August 1 each year, the Company submits a reconciliation filing for the twelve month period ended June 30, the reconciliation period. The revenue billed under the SMC for each quarter of the reconciliation period is compared to the actual revenue requirement calculated for each quarter using actual data for each of the four elements of the formula. The over or under collection of revenue is recouped or refunded as appropriate with interest over a one year period beginning on January 1 of the following year. All over and under recovery calculations include interest at the legal rate of 6%.

Q. Does the Company propose to recover the costs for implementing its Final Smart Meter Plan through its existing SMC?

A. Yes.

Q. Is the Company proposing to make any modifications to the SMC?

A. No, the Company is not proposing any modifications to the SMC in this proceeding.

III. SMART METER COSTS

Q. Has Duquesne Light identified all the estimated costs for its Final Smart Meter Plan that it seeks to recover?

A. Yes. The projected costs for all of the components of the Final Smart Meter Plan are detailed in the direct testimony and exhibits of Mr. Wolfe. As indicated in Mr. Wolfe's testimony, Duquesne Light projects that the total cost of implementing the Company's Final Smart Meter Plan will be approximately $238 million, which includes approximately $38 million of spending during the Grace Period.[1] Under the Company's Initial Smart Meter Plan, the Company estimated that it would spend approximately $38 million during the Grace Period in order to make the billing and system upgrades necessary to implement smart meter technology and to begin to develop and implement solutions for its Final Smart Meter Plan, including selection of vendors, network design, customer education, internal training and other actions.

As explained by Mr. Wolfe, the Company estimates that it will spend an additional $200 million to implement its Final Smart Meter Plan. The Company seeks Commission approval to recover the expenditures that are necessary to fully implement the Company's Final Smart Meter Plan through its existing SMC.

Q. How long does the Company propose to keep the SMC in effect?

A. The Company proposes to keep the SMC in effect until the first base distribution rate case after the final smart meter is installed and fully functional, currently estimated to be December 2020. In that base rate case, the Company will

[1] The Grace Period is the 30 month period from June 2010 to December 2012.

eliminate the SMC, prepare a final reconciliation of SMC revenue and revenue requirement for the final reconciliation period, roll PIS, accumulated depreciation, accumulated deferred income taxes and depreciation expense from the SMC at that time into base rates, and address recovery of stranded costs, if any, associated with the existing automated meter reading ("AMR") system in base rates.

Q. What is the estimated level of stranded costs associated with the current AMR meters at the completion of the Final Smart Meter Plan?

A. As of May 31, 2012, the Company had approximately $48.0 million of undepreciated investment in the meters of the AMR system. The composite remaining life of the meters is approximately 7 years, excluding ongoing investment in the existing AMR system until full deployment begins for smart meters. The Company plans to deploy smart meters from the fourth quarter 2012 through year end 2020. Since the remaining life of the existing meters is about the same as the deployment schedule for the Final Smart Meter Plan, the level of stranded costs at the completion of deployment is estimated to be relatively small.

IV. CUSTOMER REQUESTS FOR SMART METERS

Q. What are the requirements for electric distribution companies ("EDCs") to install smart meters?

A. The Act requires EDCs to furnish smart meter technology:

a) Upon request from a customer that agrees to pay the cost of the smart meter at the time of the request.

b) In new building construction.

c) In accordance with a depreciation schedule not to exceed 15 years.

Q. What are the requirements for EDCs to install smart meters during the Grace Period?

A. The *Implementation Order* states that for customers requesting a smart meter during the Grace Period, the EDC is required to provide interval data capable meters in lieu of smart meters (*Implementation Order*, page 7). The customer requesting the smart meter must agree to pay for the incremental costs for early deployment of a smart meter (*Implementation Order*, page 10-11).

EDCs are to handle new construction customer requests for a smart meter during the Grace Period in the same manner as for customer requests for smart meters (*Implementation Order*, page 13).

Q. What does the Company charge a customer for an interval data capable meter who requests a smart meter during the Grace Period, whether at an existing premise or in new construction?

A. The charges for an interval data capable meter, or Alpha meter used by the Company, are defined in the Company's tariff, Rule 14.2, Customer Request for Special Metering. The cost for an Alpha meter is $586 and the cost for the required communications systems and infrastructure is $719 for a total cost of $1,305.

Q. How did the Company develop the charge for an Alpha meter?

A. The basis of the fees in Rule 14.2 of the tariff is summarized in Table No. 1.

Table No. 1 Cost for Interval Data Capable Meter Installation

Alpha Meter (installed)	$586
Communications Equipment	
Enclosure	$70
Digital Modem	$450
Communication Board	$35
Antenna	$20
Power Supply	$20
Labor (3 hours)	$124
Total Communication Cost	$719
Total Meter and Communication Cost	$1305

Q. How will the Company handle customer requests for a smart meter that would require the Company to install a smart meter outside of the Company's implementation schedule after the Grace Period?

A. For customer requests and for new construction, the Company will install a smart meter and read the meter through the existing AMR fixed network system.

For customers who want next-day access to validated hourly usage data through a web portal, the Company will install an Alpha meter read through the MV-90 component of the existing AMR system. Following the FOCUS – Itron Collection Engine integration in 2014, the Company will install a smart meter with direct-connect communications providing for interval data capability.

For customers who want direct access to unvalidated data from a smart meter, the Company will install a smart meter outside of the deployment schedule that will accommodate their request.

Q. Will the Company charge customers who request a smart meter outside of the Company's implementation schedule?

A. There will be no charge to the customer for a smart meter read through the existing AMR fixed network system or through the AMI infrastructure once in-place and extended to the smart meter location. Further, there will be no charge for an Alpha meter for those customers who desire next-day access to validated usage data. Where an Alpha meter is installed, or in smart meter installations where customers desire direct access to unvalidated data from the smart meter, there will be a charge for installation and communication costs.

Q. What will the Company charge for communication equipment to read the Alpha meter or to provide direct access?

A. The Company has not yet determined what these costs will be, though the charges will be lower than the current communication charges stated in the tariff. The Company will finalize the charges later this year and update tariff Rule 14.2 in this proceeding or through a tariff supplement filing.

Q. Does that conclude your testimony?

A. Yes.

Appendix A

William V. Pfrommer

Rate and Regulatory Proceedings

Pennsylvania Public Utility Commission:

Docket No. P-2012-2301664 – Default Service Plan (POLR VI)

Docket No. R-2010-2179522 – Distribution Base Rate Case

Docket No. P-2009-2135500 - Provider of Last Resort (POLR V)

Docket No. M-2009-2093217 - Act 129 Energy Efficiency and Conservation and Demand Response Plan

Docket No. M-2009-2123948 - Act 129 Smart Meter Procurement and Installation Plan

Docket No. P-00072247 - Provider of Last Resort (POLR IV)

Docket No. R-00061346 – Distribution Base Rate Case

Docket No. P-00032071 - Provider of Last Resort (POLR III)

Federal Energy Regulatory Commission:

Docket No. ER08-1309-000 – Changes to the MISO Open Access Transmission Tariff to Integrate the Company into the Midwest Independent System Operator, Inc.

Docket No. ER05-85-000 – Changes to the PJM Open Access Transmission Tariff to integrate the Company into the PJM Interconnection, L.L.C.

Other:

Cause No. 42416, Filed April 14, 2003, Indiana Utility Regulatory Commission – Petition of Utility Center, Inc., d/b/a AquaSource

Cause No. 41968, Filed March 30, 2001, Indiana Utility Regulatory Commission – In the Matter of Utility Center, Inc., d/b/a AquaSource

Docket Nos. 2000-1074-UCR and 2000-1075-UCR, Filed June 15, 2000 – Texas Natural Resource Conservation Commission, Applications of AquaSource Utility, Inc. to Change its Water and Sewer Tariffs and Rates

TAB
3

Duquesne Light Statement No. 3

BEFORE THE
PENNSYLVANIA PUBLIC UTILITY COMMISSION

PETITION OF DUQUESNE LIGHT COMPANY
FOR APPROVAL OF ITS FINAL SMART METER TECHNOLOGY PROCUREMENT
AND INSTALLATION PLAN

Docket No. P-2012_____
Docket No. M-2009-2123948

Direct Testimony

Witness: Peter Honebein

Subject: Smart Meter Technology Customer Education and Acceptance Strategy

Direct Testimony of Peter Honebein

Q. Please state your full name and business address.

A. My name is Peter Honebein. My business address is 5450 Wintegreen Lane, Reno, NV 89511

Q. By whom are you employed and in what capacity?

A. I am employed by Customer Performance Group, LLC (CPG). I am the co-founder of CPG and a managing member.

Q. What are your current responsibilities as managing member of Customer Performance Group?

A. As managing member of Customer Performance Group, I lead consulting assignments with clients. I also perform research and design services in the areas of management and marketing strategy, customer experience, and customer education.

Q. What are your qualifications, work experience and educational background?

A. For over 25 years I have worked with companies in a variety of industries to help customers and employees adopt new innovations. With electric and gas utilities, I:

- Have developed marketing strategy for the deployment of smart meter systems.

- Served as co-principal investigator for an 8,500-customer controlled field trial that included smart meter technology, dynamic prices, enabling technology, and customer education.
- Have developed customer services strategy related to smart meter products and services.

I have also led qualitative research projects (focus groups, co-design groups, and one-on-one interviews) involving over 300 utility customers and was a co-author of the *National Action Plan for Demand Response*. Over 40 utility industry conferences have invited me to speak on topics related to the customer side of the smart grid. I have published several articles in publications such as *The Electricity Journal* and Metering *International*, and have been interviewed by *USA Today* and *Intelligent Utility*. I am the author of two books, *Strategies for Effective Customer Education* and *Creating Do-It-Yourself Customers*. I have a BA from Pepperdine University in Broadcast Sales and Management and a Ph.D from Indiana University in Instructional Systems Technology. I am also an adjunct professor at the University of Nevada, Reno and Indiana University, where I teach graduate and undergraduate classes in marketing, customer experience design, human performance technology, and instructional design

Q. What is the purpose of your direct testimony?

A. My purpose is to describe and explain Duquesne Light's Customer Education and Acceptance Plan ("CEA Plan") for its Final Smart Meter Technology Procurement and Installation plan ("Final Plan").

Q. Are you sponsoring any exhibits as part of your direct testimony?

A. Yes. A copy of Duquesne Light's Customer Education and Acceptance Plan Audiences is attached as Exhibit A.

Q. Please describe the goal and objectives of Duquesne Light's CEA Plan.

A. The goal of Duquesne Light's smart meter CEA Plan is to increase consumer confidence in the smart metering system. Consumer confidence is when consumers trust that the smart meter system is accurate, safe, secure, private, and valuable.

In some jurisdictions, such as California, Nevada, and Maine, customers have resisted smart meter technology. Their concern stems from a lack of confidence in one or more of the five confidence factors. To increase consumer confidence, Duquesne Light's CEA plan has these objectives.

- Increase employee, stakeholder, and customer awareness, acceptance and understanding of smart meter technology, including the system's accuracy, safety, security, and privacy.
- Increase customer use of smart meter enabled products and services.
- Deliver a neutral-to-positive customer experience related to the installation of smart meters.

Experiences at other utilities suggest that increasing customer use of smart meter enabled products and services will have the greatest effect on increasing consumer confidence and sustained adoption.

Q. Please describe the smart technology enabled services that will be available to Duquesne Customers.

A. Duquesne will offer a variety of smart technology enabled services. For example:

- Act 129 requires EDCs, including Duquesne, to provide customers with information on their hourly consumption. By implementing this required capability, Duquesne will offer added value services such as "Bill-to-date." Duquesne's bill-to-date service allows customers to receive alerts when they reach their pre-determined consumption and price thresholds, and also allows customers to receive projected bill services delivered through web, voice, email, or text media channels. This service may reduce surprise and worry associated with high bills, allow customers manage their consumption.
- Act 129 requires EDCs to enable time-of-use ("TOU") and real-time pricing ("RTP") programs. These programs offer customers value by potentially lowering their energy cost.
- Finally, remote connect and disconnect capability offers customer value by allowing faster service resulting in more satisfying transactions.

To summarize, the path through which customers realize the value described above starts with customers trusting the smart meter system. If customers don't have confidence in the smart meter system, then the likelihood that they will try the new products and services and use them to be "co-creators of value" will be diminished.[1]

[1] "Co-creator of value" describes a customer relationship in which customers use their knowledge and skill to unlock the value a company has embedded in products and services. For more information, please see

Q. Who are the targeted audiences for the CEA Plan?

A. Duquesne Light has identified three primary target audience categories: employees, stakeholders, and customer. Appendix A describes the specific audiences in each of the three categories as well as their roles.

By identifying specific audiences, Duquesne Light will adopt a targeted message strategy to deliver information that most effectively resonates with a given audience. For example, the "community leader" audiences will likely desire messages and content that enables them to answer constituent questions. The "small business" audience will likely desire messages and content related to the needs of their business, especially business continuity during meter deployment. Customers will likely receive information related to the five confidences discussed above.

Q. Please provide an overview of Duquesne Light's CEA Plan?

A. Duquesne Light's CEA program is designed to facilitate customer awareness and acceptance of smart technology. The foundation of this program is the 90-60-30 day strategy, a good practice that other utilities have used to communicate with the targeted audiences. 90-60-30 refers to the number of days prior to installing a smart meter during which specific information, education, and customer experience tactics are implemented. I describe each phase below.

90 Days. At least 90 days before installing smart meters in a specific community or geography, Duquesne Light will:

Honebein, P. C. and Cammarano, R.F. (2008), "Crafting a Persuasive Smart Meter Customer Experience." *Metering International*, January(1), 102-105.

1. Establish a website that contains information about the smart meter system.
2. Increase employee and vendor education efforts about the smart meter system and its deployment.
3. Increase stakeholder education efforts about the smart meter system and deployment.

The website will be the primary source of information (text, graphical, and video) about Duquesne Light's smart meter initiative and deployment for all audience segments. The website will also include tools for customers, such as an interactive smart meter deployment map that provides customers information on when they can expect installation of their smart meter.

Duquesne Light's approach for employees will be to provide information and education so that all employees can act as advocates for the smart meter system. This means that employees will communicate positively with other employees, family, friends, and neighbors about the system. To achieve this objective, Duquesne Light will use a variety of methods to build employee awareness and understanding. These methods include:

- Town hall meetings
- Training classes
- Internal newsletters
- Office signage
- Employee intranet
- Involving employees in testing smart meter products and services

For front-line employees, Duquesne Light will employ additional educational methods that teach specific skills associated with the employee's job role. This may include advanced training for call center representatives, field liaisons, installers and daily field briefings for field liaisons and installers. Duquesne Light's approach for stakeholder education will be one of personalized meetings, group presentations, and events (such as stakeholder collaborative). Duquesne Light will support these activities with collateral materials, props, videos, and demonstrations of smart meter services. In these settings, Duquesne Light intends to be the stakeholders' "trusted advisor" regarding the smart meter systems so that stakeholders will:

- Have confidence in the smart meter system.
- Be prepared for customer questions and concerns related to the smart meter system.
- Communicate to their constituencies in a fair and balanced way.

60 Days. Approximately 60 days before deploying smart meters in a specific region, Duquesne Light will conduct outreach events and presentations for both residential and business community members. The media Duquesne Light plans to use for community outreach includes PowerPoint presentations, trade show-style booths, and a mobile display (similar to other mobile smart meter/grid displays used by utilities, such as Oncor's Mobile Experience Center and Reliant Energy's Smart Home Solutions recreational vehicle). The likely venues for these outreach presentations include community groups (Chambers of Commerce, Rotary, citizens' councils, political groups), homeowners' associations, and

community events (street fairs, farmers' markets, and athletic events). Content presented during these events will focus on features and benefits, function (how the system works), and confidence (accuracy, security, privacy, health, and value). To increase participation in these community presentations, Duquesne Light may use paid and non-paid media to generate interest and awareness. Speakers at these events will include members of Duquesne Light's employee speaker team.

30 Days. Thirty days before installing a smart meter at a customer's premises, Duquesne Light will implement a targeted direct media campaign. The first element is a direct mail letter which informs customers of the forthcoming smart meter installation. It also provides the customer information about the function, benefits, and confidence associated with the smart metering system. All communication materials will include Duquesne Light's call center website address and phone number for additional information

Three days before deploying meters at a customer's premises, customers will receive an automated phone call and/or email reminding them of the smart meter installation. This communication will provide customers as precise a time as possible for when the meter will be installed.

At the time of installation, installers will perform the installation according to a customer experience script (knock, explain, install, and leave record of work). A Duquesne Light field liaison will be available to provide immediate, on-call support to customers or, when not otherwise engaged, door-to-door outreach. Five days after installation Duquesne Light will survey a sample of

customers regarding installation satisfaction and their attitudes toward the smart metering system (as compared to the baseline survey). Thirty five days after installation, customers who have signed up for Duquesne Light's My Account service or otherwise provided Duquesne Light an email address will receive a notification that their smart meter services (bill-to-date, bill alerts, projected bill, and hourly usage data) are now available to them online.

Q. How will the Company measure the success of its CEA Plan?

A. Duquesne Light will measure the success of its customer experience and education efforts through three specific methods.

First, prior to launching the CEA plan, Duquesne Light will conduct focus group tests to ensure that the approach, themes, messages, media, and methods meet customer requirements. Additionally, Duquesne Light will administer a baseline survey that gathers customer attitudes toward the smart meter system prior to implementation. This baseline survey will enable Duquesne Light to then determine the impact of the CEA plan on consumer attitudes.

Second, after implementing the 90-60-30 strategy, Duquesne Light will track the:

- Number of website visits it receives
- Number of calls it receives from customers
- Classification of those calls in appropriate categories such as complaints, claims, high bill, and opt out.

Subsequent analysis of the volume and type of these calls will enable the Duquesne Light to maintain or adjust its customer experience, customer education, and customer support efforts. Additionally, Duquesne Light will collect customer feedback during outreach presentations regarding customer attitudes toward the smart meter system.

Third, five days after the installation of smart meters, Duquesne Light will survey a sample of customers regarding their satisfaction with the installation experience. Analysts will integrate the survey results into a weekly dashboard report for Duquesne Light. This report will guide Duquesne Light in taking appropriate action to correct deficiencies in the customer experience.

Q. Has this type of outreach strategy been employed by other public utilities deploying smart meter technology, and if so, with what result?

A. Yes. The customer experience and education methods described in this testimony were originally designed, developed, tested, and implemented at San Diego Gas & Electric (SDG&E). The Structure Group identified SDG&E's smart meter deployment as the "Gold Standard" in its testimony to the California Public Utilities Commission.[2] Furthermore, SDG&E received several awards from industry organizations for its smart meter deployment, including Utilimetric's Consumer Outreach award.[3] ComEd used similar communication and deployment

[2] San Diego Gas & Electric (2010). Prepared Rebuttal Testimony of Thomas Bialek, Ph.D., PE. Testimony before the California Public Utilities Commission. http://sdge.com/sites/default/files/regulatory/Exh%20SDG%26E-211%20-%20T_Bialek_Rebuttal_(SmartGRID).pdf. Accessed June 13, 2012.

[3] Utilimetrics (2011). San Diego Gas & Electric Wins Utilimetrics Consumer Outreach Award. Press Release. June 13, 2012.

methods in its 2009/2010 pilot of 120,000 meters, which resulted in 90% customer satisfaction with the installation process.[4] NV Energy also used these methods in its smart meter deployment that started in 2010.

Q. **Does this conclude your testimony?**

A. Yes.

[4] Commonwealth Edison Company (2012). *Chapter 4: Direct Testimony of Jennifer Montague.* Testimony before the Illinois Commerce Commission.

Exhibit A – Customer Education and Acceptance Plan Audiences

Audience	Role
Employees	
• **Installers**	Installers install the smart meters. They have customer contact prior to installation and when the work is completed.
• **Field Liaison**	The field liaison is a person skilled in energy audits who accompanies the installers to provide door-to-door outreach to customers and troubleshoot customer complaints.
• **Call Center**	The call center provides customers information and education regarding smart meters and processes customer complaints and claims.
• **Other**	All other employees serve as ambassadors who can explain the smart meter system to family, friends, and neighbors.
Stakeholders	
• **Elected Officials and Staff**	Elected officials and their staffs are a source of information about the smart metering system for constituents and a channel for receiving customer complaints.
• **Community Leaders**	Community leaders include political organizations, special-interest organizations, business organizations, service organizations, faith-based organizations, and schools. They act as third-party communicators to customers.
• **Media**	Media includes representatives of newspapers, television, and radio who communicate with customers.
• **Electric Generation Suppliers (EGS)**	EGS's are the retailers who sell the electric commodity to customers and may develop new products and services based upon the smart metering system.
• **Curtailment Service Providers (CSPs)**	CSPs provide energy and demand response products to encourage customers to curtail usage at times of peak load.
• **Service Providers**	Service providers include contractors, electricians, aggregators, and others who act on behalf of customers and provide information to customers about electric appliances and services.
• **Union Leaders**	Union leaders are the representatives of DLC employees who are represented under collective bargaining agreements. They act as third-party communicators to employees.
Customers	
• **Residential**	Residential customers include customers who live in single-family and multi-family premises who take service on rates RS, RH, and RA.
• **Commercial and Industrial (C&I)**	C&I customers include those who take service on rates GS/GM and GMH.[5]

[5] C&I customers who take service on rates GL, GLH, L, and HVPS already have interval meters and will not be receiving smart meters.