

**Duquesne Light Company  
Distribution Rate Case  
Docket No. R-2018-3000124**

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**BEFORE THE  
PENNSYLVANIA PUBLIC UTILITY COMMISSION**

**Docket No. R-2018-3000124**

**Duquesne Light Company**

**Statement No. 1**

**DIRECT TESTIMONY OF C. JAMES DAVIS**

**Dated: March 28, 2018**



1 **Q. Please state your name and business address.**

2 A. My name is C. James Davis. My business address is 411 Seventh Avenue,  
3 Pittsburgh, PA 15219.

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

5 A. I am employed by Duquesne Light Company (“Duquesne Light” or “Company”)  
6 as the Director – Rates, Energy Procurement, and Federal/RTO Affairs. I am  
7 responsible for the oversight and direction of the Company’s Rates & Tariff  
8 Services Department, Supply Procurement and RTO Settlement activities, as well  
9 as Federal and RTO affairs.

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

11 A. I graduated from St. Vincent College with a Bachelor of Arts degree in Computer  
12 Science in 1989 and Duquesne University with a Master of Business  
13 Administration in 1995. Prior to joining Duquesne Light, I had more than 24 years  
14 of diversified experience in the utility industry working for Allegheny Energy and  
15 FirstEnergy. I have held positions in Risk Management, Finance, Portfolio  
16 Management, Generation Dispatch, and Commodity Operations.

17 **Q. Have you previously testified before the Commission or other regulatory  
18 agencies?**

19 A. Yes, I testified in the 2016 Petition of Duquesne Light Company for Approval of a  
20 Distribution System Improvement Charge at Docket No. P-2016-2540046 and in  
21 the Company’s Petition for Default Service Plan for the period of June 1, 2017  
22 through May 31, 2021 at Docket No. P-2016-2543140.

1 **Q. What is the purpose of your testimony?**

2 A. The purpose of my testimony is to provide an overview of Duquesne Light, to  
3 explain the reasons for the proposed rate increase, and to identify the witnesses  
4 providing direct testimony on behalf of Duquesne Light. My testimony has been  
5 divided into four sections: Section I provides an overview of Duquesne Light and  
6 its requested rate increase. In Section II, I discuss the Company's initiatives to  
7 manage cost, improve employee engagement and train the next generation of utility  
8 employees. Section III details the primary reasons for requesting this rate relief.  
9 Section IV describes the organization of the filing, introduces Duquesne Light's  
10 witnesses in the proceeding and reviews the importance of this case to Duquesne  
11 Light, its customers, and southwestern Pennsylvania.

12 **Q. Are you sponsoring any exhibits at this time?**

13 A. Yes, I am sponsoring the Statement of Reasons.

14 **I. OVERVIEW OF DUQUESNE LIGHT AND THE REQUESTED**  
15 **DISTRIBUTION RATE INCREASE**

16 **Q. Please provide some background on Duquesne Light**

17 A. For more than 135 years, Duquesne Light has been serving the people of the greater  
18 Pittsburgh region with reliable electric service. The Company provides  
19 distribution, transmission, and provider of last resort services to approximately  
20 596,000 customers within its service territory that extends across two counties and  
21 covers approximately 817 square miles. Duquesne Light is a "public utility" and  
22 an "electric distribution company" ("EDC") as those terms are defined under 66 Pa.  
23 C.S. §§ 102 and 2803.

1 **Q. Please describe the increases and changes in rates for distribution service that**  
2 **the Company is proposing.**

3 A. The Company is proposing a general rate increase to its distribution rates and is  
4 also proposing to roll its smart meter and Distribution System Improvement Charge  
5 (“DSIC”) into base rates. The Company also proposes to expand its offering of  
6 LED Street Lights, and to implement Electric Vehicle and microgrid pilot  
7 programs.

8 **Q. Please describe the changes to existing rate riders that affect distribution base**  
9 **rate revenue in this proceeding.**

10 A. The Company currently has Commission approval to implement a Smart Meter  
11 Technology Procurement and Installation Plan beginning May 11, 2010 at Docket  
12 No. M-2009-2123948. The Smart Meter Charge (“SMC”) Rider recovers the cost  
13 of implementing its Smart Meter Technology Procurement and Installation Plan.  
14 The Company proposes to roll the projected SMC Rider charges and costs into base  
15 distribution rates and reset the SMC Rider to zero. The SMC Rider will remain in  
16 the Company’s tariff and will be utilized to recover/credit any under/over collection  
17 of costs from prior periods. Additionally, the Company has Commission approval  
18 to implement a DSIC Rider beginning October 1, 2016 at Docket No. P-2016-  
19 2540046. The Company proposes to roll the projected DSIC Rider charges and  
20 costs into base distribution rates and reset the DSIC Rider to zero as of the effective  
21 date of the base distribution rates determined in this proceeding.

1 **Q. Please provide a summary of the Company's request for a distribution rate**  
2 **increase.**

3 A. Duquesne Light is requesting the Commission approve a \$133.8 million  
4 distribution rate increase effective January 1, 2019. If the Company's request is  
5 approved as submitted, the total bill (which includes rates for distribution,  
6 surcharges, transmission, and generation) for a residential customer using 600  
7 kilowatt-hours ("kWh") per month and taking default power service from the  
8 Company would increase from \$98.15 per month to \$106.80 per month or by 8.82  
9 percent. Of the above mentioned increase, \$26.3 million represents a roll from the  
10 Smart Meter Rider into base distribution rates and \$25.7 million represents a roll  
11 from the DSIC Rider into base distribution rates.

12 **Q. Has the Company accounted for the impact of tax reform legislation, known**  
13 **as the Tax Cuts and Jobs Act of 2017 (TCJA) , signed into law in December**  
14 **2017?**

15 A. Yes, Mr. O'Brien in Statement No. 9 and Mr. Simpson in Statement No. 11 discuss  
16 the impacts of the new tax law on the Company's income tax expense and related  
17 calculations.

18 **Q. Has the Company calculated what would have been the level of a consolidated**  
19 **tax savings adjustment for Duquesne Light Company under ratemaking prior**  
20 **to the enactment of Section 1301.1 of the Public Utility Code?**

21 A. Yes, in Mr. Simpson's direct testimony he presents a calculation in Exhibit MLS-2  
22 that identifies that the consolidated tax adjustment applicable to Duquesne Light  
23 would have been \$5.5 million.

1 **Q. Does the Company’s rate case claim in this case support the conclusion that it**  
2 **is using at least 50 percent of that revenue requirement amount to support**  
3 **reliability or infrastructure related capital investment?**

4 A. Yes, as discussed in Mr. Morris’ direct testimony (Statement No. 4), the Company’s  
5 planned capital additions for reliability or infrastructure projects in excess of its  
6 LTIP in both the Future Test Year (“FTY”) and the Fully Projected Future Test  
7 Year (“FPFTY”) is greater than 50 percent of the amount of what would have been  
8 the consolidated tax savings adjustment.

9 **II. COMPANY INITIATIVES TO MANAGE COSTS, IMPROVE**  
10 **EMPLOYEE ENGAGEMENT, AND TRAIN THE NEXT GENERATION**  
11 **OF EMPLOYEES**

12 **Q. Please describe some of Duquesne Light’s efforts to control costs while**  
13 **maintaining high levels of customer service and reliability.**

14 A. The Company has created a centralized Supply Chain organization to provide  
15 market competitiveness on goods and services while incorporating technical &  
16 commercial differentiations of the supply base. The Supply Chain organization  
17 utilizes an industry recognized software tool, PowerAdvocate, to conduct sourcing  
18 events which weigh commercial, technical, and pricing criteria. The commercial  
19 aspect evaluates the overall financial stability of the Company. The technical  
20 portion consists of a series of questions determined by the requesting business unit  
21 to access the overall technical capability of the supplier as it relates to the requested  
22 goods and/or services. Lastly, the price is evaluated and negotiated utilizing  
23 Procurement techniques. Market price is defined by calculating the median of all  
24 offers submitted for the particular good and/or service requested. This process  
25 allows Supply Chain to achieve better than market pricing while also evaluating the

1 value generated from a strong supplier technically and commercially.  
2 Furthermore, Supply Chain has embraced Six Sigma within Lean Methodology to  
3 reduce overall inventory levels in the warehouses. In December of 2014 inventory  
4 levels were \$27 million versus February of 2018 levels of \$24 million, a reduction  
5 of approximately 11 percent. However, Supply Chain continues to bring in more  
6 inventory in appropriate categories to better support our customer requirements.  
7 Overall, Supply Chain eliminates waste in both inventory and cost with customer  
8 service and reliability in the forefront of their strategy.

9 **Q. Please describe some of Duquesne Light's efforts to effectively manage and**  
10 **improve performance and employee engagement.**

11 A. The Company has undertaken several initiatives to improve performance and  
12 employee engagement. First, in order to communicate the overall past performance  
13 and future objectives, senior leadership has instituted an annual All-Employee  
14 Meeting in 2015. Second, to determine the needs of employees and measure year-  
15 over-year progress in key cultural factors as well as managerial success, the  
16 Company has developed an annual employee engagement survey that has been  
17 administered since 2015. This survey focuses on two areas, cultural factors and  
18 managerial effectiveness. Cultural factors include areas of safety, communication,  
19 fair/equitable, leadership, teamwork, and feedback/performance. Managerial  
20 effectiveness include areas of workplace satisfaction, expectation setting,  
21 motivation, accountability, training & development, recognition/listening, and  
22 trust. The survey uses a scale of 1 (lowest) to 5 (highest).

1 Q. What results has the Company seen since 2015?

2 A. The following tables summarize the results of the survey:

3

Cultural Factors						
Category	Safety	Communication	Fair and Equitable	Teamwork	Feedback / Performance	Leadership
Rank	1	2	3	5	6	4
2018 Median Score	4.13	3.60	3.57	3.35	3.24	3.46
YOY Change	1.5%	2.6%	2.9%	1.5%	0.2%	1.2%
2017 Median Score	4.07	3.51	3.47	3.30	3.23	3.42
YOY Change	1.5%	1.7%	1.2%	0.6%	3.2%	1.5%
2016 Median Score	4.01	3.45	3.43	3.28	3.13	3.37
YOY Change	1.8%	4.5%	1.2%	-0.3%	7.2%	5.0%
2015 Median Score	3.94	3.30	3.39	3.29	2.92	3.21

Managerial Effectiveness							
Category	Workplace Satisfaction	Expectation Setting	Motivation	Accountability	Training & Development	Recognition/ Listening	Trust
Rank	1	3	4	2	7	6	5
2018 Median Score	3.78	3.60	3.55	3.61	3.22	3.31	3.42
YOY Change	1.3%	2.6%	0%	1.5%	2.7%	1.8%	2.1%
2017 Median Score	3.73	3.51	3.55	3.55	3.13	3.25	3.35
YOY Change	-0.8%	1.7%	1.4%	-0.8%	1.3%	2.7%	5.7%
2016 Median Score	3.76	3.45	3.50	3.58	3.09	3.16	3.17
YOY Change	0.8%	4.5%	4.2%	3.8%	1.0%	8.6%	6.4%
2015 Median Score	3.73	3.30	3.36	3.45	3.06	2.91	2.98

4



1 Due to the strategies and initiatives Management have taken, the scores have  
2 increased from 2015 to 2018. For the FPPTY Management has chosen to focus on  
3 improving Training & Development.

4 **Q. Please explain the reasons for Managements focus in this area.**

5 A. Management has focused on Training & Development for a number of reasons  
6 some of which are: 1) This area has the lowest score across all categories since  
7 2016; 2) Human Resources has restructured to have a team dedicated to employee  
8 training/talent development; 3) Job related training becomes critical with a  
9 significant number of employees retiring and new less experienced employees enter  
10 our workforce.

11 **Q. Please describe some of the potential initiatives the Company could undertake  
12 to improve the scores in Training & Development.**

13 A. Some of the potential initiatives are:

- 14 • Additional Leadership Development Training modules
- 15 • Refined onboarding/orientation
- 16 • Employee committee to specifically focus on identifying and building  
17 training programs
- 18 • Job-specific trainings built by business units
- 19 • Technical training (e.g. Microsoft Excel) and education sessions (e.g.  
20 401k/pension)
- 21 • Mentorship programs and job shadowing opportunities
- 22 • Soft skills training (e.g. public-speaking)



1           However, these training initiatives have associated costs and there is currently a  
2           limited budget allocated to training; without additional funds, the Company's  
3           ability to act on this focus area is limited. The Company has included these  
4           additional funds as part of the increase of general expenses in the FPFTY.

5   **Q.   Please describe how Management met the challenge of a retiring workforce**  
6   **and hiring the next generation of utility personnel?**

7   A.   Overall the average age and tenure of the Company's workforce has been  
8       decreasing since the last base rate case. The average age and tenure in 2013 was  
9       47.24 and 17.58 years respectively as compared to 2017 the average age and tenure  
10      was 43.68 and 10.90 years respectively. Furthermore, 41.89 percent of our current  
11      employees as of the end of our Historical Test Year ("HTY") were hired since 2014.  
12      Overall the Company has experienced approximately 566 employees leaving  
13      service while over the same time period hiring approximately 760 new employees.

14   **III.   REASONS FOR REQUESTED RATE RELIEF**

15   **Q.   Please explain the reason for the increase in base rates proposed in this**  
16   **proceeding.**

17   A.   The three primary reasons for the Company to increase its base distribution rates  
18       are as follows:

- 19       1.   **The continued growth in the Company's distribution rate base.** The  
20           Company has invested heavily in the distribution system, consequently the  
21           rate base has grown by 25 percent since the last base rate proceeding. As  
22           Mr. O'Brien will describe in his direct testimony (Statement No. 9) the  
23           estimated rate base at December 31, 2019 will be \$383 million greater than  
24           the level currently reflected in current rates.

1           2.     **The sharp reduction in sales.** Duquesne Light’s projected 2019 revenue  
2                     at current rates is 20 million dollars less than what was agreed to in the  
3                     Settlement Agreement approved by the Commission. As Mr. Mobley  
4                     addresses in his direct testimony (Statement No. 3), sales to residential,  
5                     commercial and industrial customers combined are expected to decline by  
6                     approximately 1.1 percent annually over the three years beginning 2020.  
7                     The decline in usage in the Company’s service area is due to a combination  
8                     of factors that include; the increases in efficiency of appliances, increases  
9                     in net metering, and federal mandates to lighting standards, as well as the  
10                    implementation of Pennsylvania’s state-mandated energy efficiency and  
11                    conservation programs under Act 129. These declines are partially offset  
12                    by projected customer and Electric Vehicle growth. The Company has  
13                    made an \$8.179 million revenue adjustment to reflect this loss as Mr.  
14                    O’Brien describes in his direct testimony and calculates in Schedule D-5B.

15           3.     **Increase in operations and maintenance (“O&M”) expense.** Duquesne  
16                    Light’s projected O&M expenses are 14 percent higher than in the last rate  
17                    proceeding. The primary drivers include: 1) an increase of approximately  
18                    200 employees primarily in the Operations and Information Technology  
19                    areas. 2) Wage increases of approximately 3.0 percent per year. 3) Costs of  
20                    the previously mentioned Riders included in base rates. 4) Inclusion of the  
21                    Company’s electrical model to improve reliability and response to customer  
22                    outages. These increases are partially offset by the reduction in pension  
23                    expense.

1 **IV. ORGANIZATION OF THE FILING, WITNESSES, AND THE**  
2 **IMPORTANCE OF THE CASE TO DUQUESNE LIGHT**

3 **Q. Please identify the other witnesses presenting testimony on behalf of Duquesne**  
4 **Light and the principal matters they will address.**

5 A. In addition to my testimony which is Statement No. 1, the witnesses presenting  
6 direct testimony and the principal subjects they address are summarized as follows:

Matthew Ankrum	Statement No. 2	Provides an overview of the Company's accounting process. Explains the Company's actual financial results for the Historic Test Year and reviews the budgeted financial results for the Future Test Year and the Fully Projected Future Test Year.
Todd Mobley	Statement No. 3	Provides an overview of the sales forecast. Describes the outcome of the sales forecast model for the Historic Test Year, the Future Test Year, and the Fully Projected Future Test Year. Gives supporting details on the impacts of key drivers to the overall sales forecast including the effects of Energy Efficiency and Conservation.
Benjamin Morris	Statement No. 4	Describes the Company's capital additions planned to be placed in service through the end of the Fully Projected Future Test Year. Provide a description of the Company's electric delivery system, a description of the planning process to ensure the system continues to meet the needs of its customers. This would include items such as reliability metrics, and other capital projects.
Jim Karcher	Statement No. 5	Provides details supporting the electrical model the Company proposes to install.
Joe Dematteo	Statement No. 6	Describes the proposed EV pilot that the Company is seeking recovery for, as well as describes the expanded LED Street Light offering.

Katie Scholl	Statement No. 7	Describes the Company's customer satisfaction and service efforts. Including changes in how the Company proposes to recover bank card fees from customers.
Mark Miko	Statement No. 8	Discusses the various Information Technology initiatives the Company proposes to implement.
Robert L. O'Brien	Statement No. 9	Discusses the components of Duquesne Light's overall revenue requirement, and will support certain pro forma ratemaking adjustments for the fully projected future test year ended December 31, 2019 ("FPFTY"), the future test year ended December 31, 2018 ("FTY") and the historic test year ended December 31, 2017 ("HTY"), and portions of the claimed measures of value, including Duquesne Light's cash working capital allowance.
John J. Spanos	Statement No. 10	Provides the service life study and depreciation study which supports the Company's depreciation accruals for rate making purposes utilizing Commission approved procedures.
Matthew L. Simpson	Statement No. 11	Discusses the Company's tax expense and related tax information for the Historic Test Year, the Future Test Year, and the Fully Projected Future Test Year.
Paul R. Moul	Statement No. 12	Provides evidence, analysis and recommendation concerning the appropriate rate of return that the Commission should recognize in the determination of the revenues that the Company should realize as a matter of the proceeding.



Jim Milligan	Statement No. 13	Provides explanation of the Company's current and future capital structure, cost of long-term debt, current credit ratings and the importance of maintaining the credit worthiness of the Company.
Howard S. Gorman	Statement No. 14	Describes the Jurisdictional Separation Studies and the unbundled, Allocated Cost of Service Study used in this proceeding.
Dave Ogden	Statement No. 15	Addresses the allocation of the proposed revenue increase among the rate classes and the relative rate class returns. Describe the rate design principles and how they are used to determine the proposed rates. Prove out that the proposed rates produce the target revenue for each class. Describe the proposed changes to the Company's retail tariff.

1

2 **Q. Please explain the importance of the proposed rate increase to Duquesne**  
3 **Light.**

4 A. In order to continue to provide enhanced reliability, prepare for catastrophic events,  
5 such as storms or cyber-attack and meet increasing customer service needs, the  
6 Company must continue to make substantial investments in new distribution plant  
7 as well as replace ageing infrastructure including the investments identified in its  
8 Commission approved LTIP. The Company must do this during a period of  
9 declining sales, DSIC revenues reaching the limit of 5.0 percent of base revenue as  
10 required under 66 Pa. C.S. §1358(a) by the end of the Future Test Year, and  
11 increasing O&M expenses. Due to these factors, Duquesne Light's projected  
12 overall rate of return for the Fully Projected Future Test Year, at present rates, is  
13 only 5.27 percent. More importantly, the estimated return on common equity

1           during the same period is 5.83 percent. As Mr. Moul will address in his direct  
2           testimony (Statement No. 12), this level of return on equity is inadequate to attract  
3           the necessary capital and sustain the level of investment necessary to ensure  
4           customers continue to receive safe, reliable electric service. Therefore, it is  
5           important that the Company be granted the rate relief it has requested in this  
6           proceeding.

7   **Q.    Does this complete your Direct Testimony at this time?**

8   **A.    Yes.**

**BEFORE THE  
PENNSYLVANIA PUBLIC UTILITY COMMISSION**

**Docket No. R-2018-3000124**

**Duquesne Light Company**

**Statement No. 2**

**DIRECT TESTIMONY OF MATTHEW S. ANKRUM**

**Dated: March 28, 2018**

1 **Q. Please state your full name, business affiliation and address.**

2 A. My name is Matthew S. Ankrum. I am the Controller of Duquesne Light Company  
3 ("Duquesne Light" or the "Company"). My business address is 411 Seventh  
4 Avenue, Pittsburgh, PA 15219.

5 **Q. Please describe your education and work experience.**

6 A. I graduated from the University of Pittsburgh with a Bachelor of Arts in Economics  
7 and a Certificate in Accounting in 1997. After graduating I was employed with  
8 Deloitte & Touche LLP for six years and was an Audit Manager when I left the  
9 firm.

10 Prior to joining Duquesne Light, I spent almost 4 years at Equitable Resources, Inc.,  
11 serving in the positions of Financial Specialist and Assistant Controller. I joined  
12 the Company in 2007 in the title of Assistant Controller and was promoted to  
13 Controller in 2012. In my role as Controller, I have responsibility for accounting  
14 and financial reporting, financial planning & analysis, business analysis and taxes.  
15 I am a Certified Public Accountant ("CPA"), and a member of both the  
16 Pennsylvania and American Institutes of Certified Public Accountants ("AICPA").

17 **Q. Have you previously testified before the Commission or other regulatory  
18 agencies?**

19 A. Yes, I testified in Duquesne Light's 2013 distribution rate case Docket No.  
20 R-2013-2372129.

21 **Q. What is the purpose of your testimony in this proceeding?**

22 A. My testimony covers two main areas. First, I will provide an overview of the  
23 Company's accounting processes and explain the Company's actual financial



1 results for the Historic Test Year ended December 31, 2017. Second, I will present  
2 and review the budgeted financial results for the Future Test Year ending December  
3 31, 2018 and the Fully Projected Future Test Year ending December 31, 2019.

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

5 A. Yes, I am. I am responsible for all of the recorded historical accounts, as well as  
6 the budgeted and projected accounts of the Company. As such, I am sponsoring all  
7 of the Company's financial statements, including income statements and balance  
8 sheets for the Historic Test Year ended December 31, 2017. I am sponsoring the  
9 Company's budget for the Future Test Year ending December 31, 2018 and the  
10 Fully Projected Future Test Year ending December 31, 2019. With regard to the  
11 Pennsylvania Public Utility Commission's ("Commission") data filing  
12 requirements filed with this proceeding, I sponsor the responses related to the  
13 Company's financial statements and regarding measures of value and operating  
14 income. Please see Exhibit MSA-1 to my testimony for the listing of data filing  
15 requirements that I am sponsoring. My name is at the top of each data filing  
16 requirement that I sponsor.

17 **Q. Did you prepare or supervise the preparation of exhibits presented in your**  
18 **testimony?**

19 A. Yes, various exhibits were either prepared by me or under my direction. Exhibits  
20 and data filing requirements relating to the Historic Test Year ended December 31,  
21 2017, the Future Test Year ending December 31, 2018 and the Fully Projected  
22 Future Test Year ending December 31, 2019 generally reflect the Company's

1 financial results for the historic test year and budgeted financial results for the  
2 future test year or fully projected future test years, respectively.

3 **Q. Could you please describe the material presented on Schedules B-1 through**  
4 **B-4 and Schedules B-6 through B-8 of DLC Exhibits 2, 3 and 4?**

5 A. All of the data shown in Schedules B-1 through B-4 and Schedules B-6 through  
6 B-8 were derived from either the books and records of Duquesne Light for the  
7 twelve months ended December 31, 2017 and prior, or the budget for Duquesne  
8 Light for the twelve months ending December 31, 2018 and twelve months ending  
9 December 31, 2019. Schedules B-1 shows the budgeted balance sheet of Duquesne  
10 Light as of December 31, 2018 and December 31, 2019, and the actual balance  
11 sheet as of December 31, 2017. The balances sheets of Duquesne Light are  
12 prepared in accordance with Federal Energy Regulatory Commission (“FERC”)  
13 requirements. Schedules B-2 include the statements of Duquesne Light’s operating  
14 income for the twelve months ended December 31, 2017 and budgeted for the  
15 twelve months ending December 31, 2018 and twelve months ending December  
16 31, 2019. Details of actual and budgeted operating revenues are provided in  
17 Schedules B-3. Schedules B-4 provide the actual and budgeted operations and  
18 maintenance expenses of Duquesne Light by FERC account, including the major  
19 categories of expense, such as purchased power, transmission, distribution,  
20 customer accounts, customer service and administrative and general expenses.  
21 Schedules B-6 and B-7 present the embedded cost of debt and preferred stock as of  
22 December 31, 2017 and 2018, as well as December 31, 2019. The capital structure  
23 of Duquesne Light for the test year and prior years is shown on Schedules B-8.

1 Please see further discussion of Schedules B-6, B-7 and B-8 in the testimony of  
2 Mr. James Milligan (DLC Statement No. 13).

3 **Q. Please explain the accounting system utilized by the Company.**

4 A. For the twelve months ended December 31, 2017, Duquesne Light maintained its  
5 accounting records on SSA Global's Masterpiece/Net general ledger package. The  
6 accounting records are maintained in accordance with the FERC's Uniform System  
7 of Accounts ("USofA"). Financial statements for Duquesne Light are also prepared  
8 in accordance with accounting principles generally accepted in the United States of  
9 America ("GAAP"). Duquesne Light is in the process of implementing a new  
10 general ledger package entitled Oracle Fusion which is a cloud based solution  
11 expected to be in place during the Future Test Year ending December 31, 2018.  
12 Duquesne Light maintains its property, plant and equipment accounting records on  
13 the Power Plan Consultant's fully integrated asset accounting system, referred to as  
14 PAAM. The USofA requires that utilities record all construction and retirements  
15 of electric plant by means of work orders. The work order system must show the  
16 nature of each addition to, or retirement from, electric plant, the total cost thereof,  
17 and the plant account or accounts affected. Duquesne Light uses such a work order  
18 system, and under this system, an authorized work order is used for all capital work  
19 performed.

20 **Q. What are the costs associated with the implementation of Oracle Fusion and  
21 how are these costs accounted for on the books of the Company?**

22 A. The Company estimates the total cost of implementation of Oracle Fusion to be  
23 approximately \$2.3 million. Under GAAP, costs associated with general on

1 premise internal-use software implementations can be broken into capital and  
2 operating expense categories based on the stages of the implementation (i.e.  
3 preliminary project stage, application development stage and post implementation  
4 costs). However, if the software purchase is part of a cloud-based service  
5 arrangement, such costs are ordinarily accounted for as operating expenses. As the  
6 Company has selected a cloud-based software, GAAP requires the majority of the  
7 costs, approximately \$1.8 million to be expensed.

8 **Q. Are there other cloud-based service arrangements that have been accounted**  
9 **for as operating expenses or are included in the budget as operating expenses?**

10 A. Yes, \$5.2 million of implementation costs associated with cloud-based service  
11 arrangements from May 1, 2015 through December 31, 2019 have and will be  
12 recorded as operating expenses.

13 **Q. What is Duquesne Light's claim for recovery of these costs in this rate case?**

14 A. Under current regulatory accounting rule interpretations, the Company is able to  
15 include general on premise internal use software purchases in rate base and  
16 therefore earn a rate of return, but cloud-based software is currently interpreted to  
17 be an operating expense on which no return is granted. Cloud-based services offer  
18 many advantages to traditional on premise software, such as enhanced security,  
19 reliability and flexibility. These cloud-based information systems are used by the  
20 Company to optimize various aspects of the utility service provided to its customers  
21 over, at a minimum, the useful life of a comparative on premise solution.  
22 Accordingly, cloud-based information systems provide benefits to customers over  
23 extended periods of time and not just the period in which the costs are incurred. In

1 this case, the Company is requesting Commission approval to include these costs  
2 in rate base in this case and future cases and recover the costs as depreciation  
3 expense through amortization. Please see further discussion of this adjustment in  
4 the testimony of Mr. Robert L. O'Brien (DLC Statement No. 9).

5 **Q. Has the issue of cloud-based software capitalization been before the**  
6 **Commission in other proceedings of which you are aware?**

7 A. Yes. In Pennsylvania Public Utility Commission *et al. v. UGI Penn Natural Gas,*  
8 *Inc.* (UGI) under Docket No. R-2016-2580030 UGI was permitted to capitalize the  
9 development costs for cloud-based information systems. Additionally, at the  
10 Pennsylvania Public Utility Commission Public Meeting held on August 31, 2017,  
11 Chairman Gladys M. Brown issued a statement of support for such treatment as  
12 outlined in the settlement agreement in UGI's base rate case proceeding.

13 **Q. Is there a specific provision that should be included in the Commission's final**  
14 **order related to cloud-based information systems?**

15 A. Yes, the provision is as follows:  
16 "Commencing with implementations subsequent to May 1, 2015, the Company  
17 shall be permitted to capitalize the development costs for cloud-based information  
18 systems. The Company will record the costs related to the development of cloud-  
19 based information systems as a regulatory asset at the time such costs are incurred.  
20 The Company shall begin amortization of the costs after the systems are placed in  
21 service. Amortization of the regulatory asset will be included in the Company's  
22 depreciation claim and the unamortized balance in the regulatory asset account will  
23 be included in rate base in the Company's current and future base rate proceedings"

1 **Q. How does Duquesne Light account for new plant put into service and**  
2 **associated retirements of existing plant?**

3 A. Costs of new construction are tracked in the system by the use of work orders. At  
4 the completion of each project, operations personnel notify asset accounting that  
5 the constructed or purchased assets related to a specific work order are now used  
6 and useful for their intended purpose. Based on this information, the work order is  
7 placed in service and ultimately unitized, or charged to the correct units of property  
8 in the plant accounting system. At month end, journal entries are automatically  
9 generated and posted to the general ledger for these new in-service dollars. In  
10 addition, the system calculates the allowance for funds used during construction  
11 (“AFUDC”), spreads overheads, calculates depreciation expense, processes  
12 unitized additions and processes plant retirements. The related journal entries are  
13 created and automatically posted to our general ledger.

14 **Q. Please explain why Duquesne Light is requesting permission to recover**  
15 **AFUDC for land held for future use?**

16 A. Duquesne Light has not included land held for future use in rate base in this  
17 proceeding because the land is not currently providing service to customers.  
18 However, larger projects often have relatively long lead times from commencement  
19 to completion. While Duquesne Light is authorized to record AFUDC on the  
20 project expenditures once the project commences, Duquesne Light frequently must  
21 acquire land or land rights before construction begins. It is appropriate to allow  
22 Duquesne Light to record AFUDC on land acquired to provide future service and

1 add such amount to rate base when the project is used to provide service to  
2 customers.

3 **Q. Does Duquesne Light have an internal audit program?**

4 A. Yes, Duquesne Light has an Internal Audit Department, which implements the  
5 annual internal audit program approved by the Audit Committee of our Board of  
6 Directors. This department reports to the Audit Committee, as well as the Vice  
7 President, Rates and Regulatory Affairs, General Counsel & Corporate Secretary.  
8 They perform a slate of annual internal audit and analysis projects to ensure the  
9 Company maintains strong internal controls.

10 **Q. Does Duquesne Light have an external audit conducted periodically?**

11 A. Yes, both Duquesne Light Holdings, Inc. and Duquesne Light (“Companies”) have  
12 external audits conducted annually by Deloitte & Touche LLP. Deloitte & Touche  
13 LLP recently completed their audits of the financial statements of the Companies  
14 for 2017, the results of which were unqualified opinions on the consolidated  
15 financial statements of the Companies as of December 31, 2017. Deloitte & Touche  
16 LLP also performs an annual audit of Duquesne Light’s regulatory financial  
17 statements that are included in the FERC Form 1. Deloitte & Touche LLP is in the  
18 fieldwork phase of its audit of the December 31, 2017 regulatory financial  
19 statements to be included in the December 31, 2017 FERC Form 1. The Company  
20 anticipates filing its FERC Form in April 2018. In addition to the annual  
21 audits performed by Deloitte & Touche LLP, both the FERC and the Commission  
22 have performed periodic audits of Duquesne Light.

1 **Q. Have any major accounting changes occurred since the Company's last rate**  
2 **case?**

3 A. There have been accounting changes that have occurred since our last distribution  
4 rate case in response to new pronouncements that have been issued by the Financial  
5 Accounting Standards Board ("FASB") and others. The Company has  
6 implemented these new standards and pronouncements in order to maintain their  
7 accounting records in accordance with GAAP. Please refer to data filing  
8 requirement II-D-12 that outlines the accounting changes that have occurred since  
9 our last rate case filing.

10 **Q. Are you responsible for the budget process for the Future Test Year and the**  
11 **Fully Projected Future Test Year?**

12 A. Yes, I oversee the budgeting process for Duquesne Light. The Financial Planning  
13 & Analysis Department accumulates all of the budget data from various sources  
14 each year to prepare a full income statement, balance sheet and cash flow budget  
15 for the Company for the year. The Company prepares a five year budget during its  
16 annual budgeting process.

17 **Q. Please describe the Company's budget process.**

18 A. Each year there is an annual planning process that begins in June. The budget  
19 process requires active participation at many levels throughout the organization.  
20 Retail sales of electricity are budgeted by our Business Analysis and Valuation  
21 Department, while other revenues such as pole and duct attachment and rental of  
22 electric property are budgeted by our operations group. Operations and  
23 maintenance expenses are budgeted by individual cost center managers within the



1 Company. Our Human Resources Department provides input on employee levels,  
2 salary increase projections and fringe benefit costs. The Tax Department assists in  
3 the budgeting of taxes other than income taxes, as well as income tax expense.  
4 Asset Accounting prepares the budget for depreciation and amortization expense,  
5 as well as AFUDC, based in part on information received from the Operations  
6 Group for expected capital expenditures. Our Treasury Department assists by  
7 preparing financing plans, budgeting the interest expense we expect to incur and  
8 calculating the amortization of debt discounts and premiums. The information  
9 necessary for the budget is summarized by the Financial Planning & Analysis  
10 Department in cost element detail, which shows total labor, fringes, outside services  
11 and other cost elements. See Exhibit MSA-2 to my testimony which describes the  
12 cost elements the Company uses to prepare its budget and Exhibit MSA-3 for a  
13 listing of the individual cost centers within Duquesne Light.

14 **Q. Does the Company typically prepare its budget by FERC account?**

15 A. No, we typically prepare the budget for Duquesne Light by cost element detail as  
16 this level of detail enhances the review by our cost center managers and assists them  
17 in estimating their expenses for budgeting purposes. To satisfy the requirements  
18 for this rate filing, our cost element budget was allocated to FERC accounts.  
19 Certain cost element budget amounts could be specifically assigned to certain  
20 FERC accounts as they are easily identifiable to those accounts. For other cost  
21 element budget amounts, an allocation to FERC accounts was performed based on  
22 the same percentage to the total as the actual costs for fiscal year 2016 operating  
23 and maintenance expenditures, which were reported by both cost element and

1 FERC account. Once this allocation was performed, the results were reviewed to  
2 ensure they appeared reasonable and adjustments were made as necessary to reflect  
3 expected variances. This process is more fully described in the testimony of Mr.  
4 Robert O'Brien (DLC Statement No. 9).

5 **Q. Has the operating budget historically provided a reasonable estimate of actual**  
6 **expenditures?**

7 A. Yes, over the past three years the total operations and maintenance budget has  
8 reasonably approximated the actual costs incurred.

9 **Q. Are you aware of the requirement that a comparison of actual to budget data**  
10 **is to be supplied quarterly when you utilize a Future Test Year?**

11 A. Yes, Exhibit MSA-4 has been provided showing a breakdown of revenues and  
12 expenses for the Future Test Year and Fully Projected Future Test Year. We will  
13 provide quarterly comparisons of actual results to the budget numbers presented as  
14 the actual data for each quarter becomes available. In addition, the Company will  
15 provide, as directed by the Commission, data evidencing the accuracy of estimates  
16 contained in its Fully Projected Future Test Year.

17 **Q. Did the Company prepare a schedule comparing its actual expenses for the**  
18 **twelve –months ended April 30, 2015 to its projections in the last rate case**  
19 **proceeding?**

20 A. Yes, please see Exhibit MSA-5. As recognized in the previous rate case settlement  
21 agreement, the agreement was deemed to be a black box settlement which  
22 represents a compromise of the Parties' positions on various issues.

1 **Q. Did Duquesne Light prepare a comparison of its rate base additions for the**  
2 **twelve months ended April 30, 2015 to its projections in the 2013 rate case?**

3 A. Yes, please see Exhibit MSA-6 for this comparison.

4 **Q. Have you made any adjustments in your Future Test Year or Fully Projected**  
5 **Future Test Year to account for known and measurable changes?**

6 A. Yes, we have. Mr. Robert O'Brien is sponsoring all the adjustments that are known  
7 and measurable, and his testimony will address those items specifically.

8 **Q. Does the Company plan to recover deferred costs of required Eligible**  
9 **Customer Listing mailings in this rate filing?**

10 A. Yes, pursuant to the Commission's order (Docket No. M-2010-2183412), the  
11 Company was granted permission to recover the costs associated with its required  
12 triennial eligible customer listing mailings through its next base rate case  
13 proceeding. As of December 31, 2017, the Company maintains a regulatory asset  
14 of approximately \$0.3 million for which recovery is being requested.

15 **Q. How does the Company plan to recover these deferred costs?**

16 A. As the costs associated with the Commission required mailings is on-going, the  
17 Company has included an adjustment to normalize the associated costs over a three  
18 year period as described in Mr. Robert O'Brien's testimony.

19 **Q. Why are you using a three year period for the normalization of the costs**  
20 **associated with Eligible Customer Listing mailings?**

21 A. Three years is consistent with the triennial mailing requirement as established by  
22 the Commission.

1 **Q. How was the budgeted retail sales derived?**

2 A. Mr. Mobley prepares a detailed budget for retail sales based on an extensive  
3 econometric analysis. Please see his testimony in DLC Statement No. 3 for details  
4 regarding this budget process.

5 **Q. How were the other operating revenues budgeted?**

6 A. Other operating revenues may be divided into two categories, operationally-  
7 oriented and miscellaneous. Our Operations Group provides the budgeted amounts  
8 for operationally-oriented revenues such as pole and duct attachment, rental of  
9 electric property, miscellaneous transmission charges and other miscellaneous  
10 operationally-oriented revenue. The miscellaneous categories are determined  
11 based on historical trends adjusted for known changes or initiatives being  
12 undertaken. These amounts include late payment charges, returned check fees and  
13 reconnect fees.

14 **Q. How do cost center managers prepare their budgets for operations and  
15 maintenance expenses?**

16 A. Cost center managers across the Company are provided with budgeting instructions  
17 and a budget template to fill out and submit to the Company's Senior Manager of  
18 Financial Planning & Analysis, who reports to me. This template identifies and  
19 requires cost center managers to budget using cost elements that the Company uses  
20 to develop, track and report on its budget. Cost center managers use their  
21 knowledge of the employee salary costs in their cost center and guidance provided  
22 in the budgeting directions on employee levels and management salary increases to  
23 determine the budgeted wages. Throughout the year, these cost center managers

1 receive monthly reports that compare their actual spending to budgeted expenses.  
2 Cost center managers are required to explain any significant deviations from budget  
3 as they occur throughout the year. This reporting and the related accountability  
4 helps managers to improve each successive year's budget and more accurately  
5 quantify the various costs that they expect to incur during the coming year, such as  
6 outside consultants, materials and supplies and others.

7 **Q. Do these cost center managers' budget for costs that are expected to be**  
8 **capitalized, as well as expensed?**

9 A. Yes they do. The Operations Group and other groups that spend capital dollars are  
10 provided with budget templates including all of the cost elements that are budgeted  
11 for capital. They use their understanding of the capital projects that have been  
12 planned for the next several years, as well as projections of the operating costs that  
13 they incur on an annual basis, to accurately project the capital spending for their  
14 cost center. During the year, these cost center managers receive monthly reports of  
15 the actual capital work they have performed to help them manage their costs and  
16 plan their work activities in a manner consistent with their budget.

17 **Q. Do the budgeted employee levels for the Company include an assumed level of**  
18 **open positions at any given time?**

19 A. Yes, the Company incorporates into its budget a "vacancy reserve" of 70 people to  
20 prevent ongoing, normal transitional openings from inflating our salary and wage  
21 expense. We anticipate that we will always have a level of open positions equal to  
22 our vacancy reserve unfilled but believe that vacant positions beyond those

1 reflected in this reserve will be filled by the end of the fully projected future test  
2 year.

3 **Q. Did Duquesne Light achieve employee levels agreed to in its 2013 rate case**  
4 **proceeding?**

5 A. Yes. As of April 30, 2015 Duquesne Light maintained 1,383 employees. Duquesne  
6 Light projected to have 1,363 employees as of the end of its fully projected future  
7 test year ended April 30, 2015.

8 **Q. Do you have an administrative services agreement that allows Duquesne Light**  
9 **employees to provide services to affiliates?**

10 A. Yes, Duquesne Light has an administrative services agreement in place with its  
11 affiliates. This agreement has been filed with the Commission, and is updated  
12 periodically as necessary. This agreement is explained and included as part of the  
13 response to data filing requirement II-D-8.

14 **Q. Do you consider work that Duquesne Light employees may be doing for**  
15 **affiliates in the budgeting process?**

16 A. Yes, cost center managers provide information in the budgeting process regarding  
17 any work that their department is doing for any affiliate company. In addition, the  
18 Company maintains an electronic time recording system (“E-Time”) for recording  
19 and allocating employees’ time between various affiliates and projects. Employee  
20 costs are budgeted using actual historical allocation data from E-Time, adjusted for  
21 information received from cost center managers about changing circumstances or  
22 project assignments. A projected allocation of all employees’ costs between the  
23 Company and its affiliates is prepared in this manner. The cost charged to any

1 affiliate includes the employee's salary and related benefits, as well as  
2 proportionate rent and supply costs. A total of all of the allocation amounts is  
3 calculated and is included in the budget process as a reduction in Duquesne Light's  
4 expense, which we refer to as subsidiary reimbursements.

5 **Q. Does Duquesne Light share office space with its affiliates, and are the affiliates**  
6 **charged for this space?**

7 A. Affiliates of Duquesne Light do not lease office space in the same building as the  
8 Company, and those affiliates have separate lease agreements with the building  
9 owner for the space they utilize.

10 **Q. Please provide a summary of ring fencing measures that are in place at**  
11 **Duquesne Light in order to provide a separation between Duquesne Light's**  
12 **regulated operations and those of its parent and other nonregulated affiliates.**

13 A. Duquesne Light and its parent, Duquesne Light Holdings ("Holdings"), maintain  
14 policies and practices which provide effective segregation (ring fencing) between  
15 the activities of the Company and those of its parent and nonregulated affiliates. In  
16 addition, various external agencies and regulatory bodies have placed restrictions  
17 on the Company that provide additional assurance that effective separation has been  
18 achieved. The Company is a separate legal entity from Holdings, maintains stand-  
19 alone financial statements, receives its own credit rating from Standard & Poor's  
20 and Moody's and is able to independently raise capital via external markets.

21 Other ring fencing measures include:

- 22 • The Company's Articles of Incorporation limit it from declaring or paying  
23 dividends on any shares of capital stock ranking junior to Duquesne Light's

1 Preferred Stock if the Common Stock equity of Duquesne Light is less than  
2 25% of total capitalization.

3 • DQE Holdings LLC, the ultimate parent company, has appointed a locally  
4 based, independent director to its Board of Directors in order to ensure that our  
5 organization models best practices in corporate governance and that corporate  
6 decisions reflect the interests of our local community.

7 • The Company does not participate in its Parent's cash concentration system  
8 (cash pool) with Holdings or other affiliates that are not regulated by the  
9 Commission. As a result, nonregulated entities cannot use the Company's  
10 surplus cash for their operations.

11 **Q. In conjunction with other Commission approved settlement agreements, has**  
12 **the Company agreed to ring fencing measures?**

13 A. Yes. The Company has agreed to the following ring fencing measures:

14 • Duquesne Light shall not guarantee the debt or credit instruments of its parent  
15 or any affiliate not regulated by the Commission, except as approved by the  
16 Commission upon a determination that such guarantee provides net benefits to  
17 customers.

18 • Duquesne Light shall not grant a mortgage or other lien on any property used  
19 and useful by Duquesne Light in providing retail utility service to the public  
20 subject to the Commission's jurisdiction, except for the financing needs of  
21 Duquesne Light.

22 • Duquesne Light shall not make any loan or otherwise extend credit to its parent  
23 or any affiliate not regulated by the Commission for a term of one year or more,



- 1           except as approved by the Commission upon a determination that such loan or  
2           credit extension provides net benefits to customers.
- 3           • DQE Holdings will not permit a change in ownership among the members of  
4           DQE Holdings without prior Commission approval if such change would result  
5           in a change in control under the then-applicable Commission standards.
  - 6           • Duquesne Light will seek Commission approval of all new or amended  
7           agreements with affiliates consistent with Chapter 21 of the Public Utility Code.
  - 8           • Duquesne Light shall continue to have outstanding separately issued debt held  
9           by investors not affiliated with Duquesne Light or its affiliates, unless the  
10          Commission authorizes to the contrary.
  - 11          • Duquesne Light's long-term debt ratio as a percentage of total capitalization  
12          shall not exceed 60%, absent approval from the Commission.
  - 13          • Duquesne Light shall notify the Commission of its intention to declare a special  
14          cash dividend to Duquesne Light Holdings, Inc., at least 30 days before  
15          declaring the dividend.
  - 16          • The Chief Executive Officer ("CEO") of Holdings will be a member of DQE  
17          Holdings Board of Directors (Board), and will also chair a management  
18          committee, which will contain representatives of both the senior management  
19          team and the ownership consortium.
  - 20          • Holdings shall maintain, and cause its subsidiaries including Duquesne Light to  
21          maintain, separate books and financial records.

- 1 • DQE Holdings will maintain corporate organizational and financial policies  
2 sufficient to permit Duquesne Light to continue to meet requirements to  
3 maintain its own credit ratings, separate from its parent.
- 4 • Holdings and its subsidiaries shall remain organized in a manner that provides  
5 corporate separation of regulated and non-regulated activities.

6 **Q. How do you budget for fringe benefits provided to employees?**

7 A. This process varies, depending on the type of fringe benefits. However, common  
8 benefit programs are provided to employees of Duquesne Light and its affiliates.  
9 Therefore, the initial step is determining the total cost expected to be incurred. The  
10 Human Resources department reviews each of the health coverage plan costs for  
11 the current year and then the budget is developed taking into consideration the  
12 present number of eligible employees, projected changes in the numbers of eligible  
13 employees, anticipated changes in employee contribution levels and estimated cost  
14 increases. Once the total cost has been established, the percentage of that total cost  
15 that is applicable to Duquesne Light employees and affiliate employees is  
16 determined on a pro-rated basis. The respective cost allocable to each company is  
17 then charged to the appropriate company.

18 **Q. Do you allocate the cost of fringe benefits to both capital jobs and expense?**

19 A. Yes we do. This allocation is calculated based on the total amount of budgeted  
20 labor costs to be incurred from the annual budgeting process. Based on past  
21 experience and their knowledge of planned capital projects, cost center managers  
22 separately budget the amount of labor that will be charged to expense or to capital.  
23 The result is used to allocate the benefit costs so that the benefit costs are allocated

1 between expense and capital in a manner that is proportionate to the related labor  
2 costs.

3 **Q. What types of benefits do you provide to Duquesne Light employees?**

4 A. Benefits for 2017 include medical and dental coverage, flexible spending accounts,  
5 life insurance, accident insurance, business travel insurance, disability benefits, an  
6 employee assistance program and tuition reimbursement. In addition, we maintain  
7 a retirement plan (“Plan”) to provide pensions for eligible full-time employees. The  
8 Plan is closed to new participants. Upon retirement, an eligible employee receives  
9 a monthly pension based on his or her length of service and compensation. The  
10 cost of funding the pension plans is determined by the unit credit actuarial cost  
11 method. Our policy is to budget using the actuarially determined net periodic  
12 pension cost calculated by our actuaries under the provisions of Accounting  
13 Standards Codification 715 (“ASC 715”). All employees can also participate in the  
14 Company’s defined contribution retirement plan; however, employees not eligible  
15 to participate in the pension plan receive expanded levels of Company matching  
16 funds in lieu of pension benefits.

17 **Q. Is the Company self-insured for any employee benefits, and if so, how is the  
18 budget for those benefits estimated?**

19 A. Yes, Duquesne Light is self-insured for its employee medical coverage, which is  
20 administered by Highmark Blue Cross Blue Shield under a national Preferred  
21 Provider Organization (“PPO”) arrangement. The budget estimates are developed  
22 based on the previous year’s claim costs with adjustments for anticipated changes  
23 in the number of eligible employees, employee contribution levels and cost

1 increases based on healthcare industry outlook. Duquesne Light does maintain  
2 stop-loss insurance coverage to cover individual claims that are over \$300,000 per  
3 incident.

4 **Q. How has Duquesne Light tried to minimize healthcare coverage costs?**

5 A. Over the past several years, Duquesne Light has taken various steps to mitigate the  
6 high cost of healthcare, such as promoting employee wellness programs,  
7 performing dependent eligibility audits, increasing employee contribution levels,  
8 negotiating reductions in Highmark’s administrative fees and reviewing  
9 opportunities to enter healthcare exchanges.

10 **Q. What is the current funded status of Duquesne Light’s pension plan?**

11 A. The Plan’s funded status on a GAAP basis (the basis utilized for financial reporting  
12 purposes) as of December 31, 2017 is a deficit of approximately \$117.9 million.

13 **Q. What is the expected funded status at December 31 over the next six years?**

14 A. Please see the chart below:

	<u>Expected Funded Status (in millions)</u>					
	<u>2018</u>	<u>2019</u>	<u>2020</u>	<u>2021</u>	<u>2022</u>	<u>2023</u>
Funded Status	<u>\$ (93.5)</u>	<u>\$ (80.8)</u>	<u>\$ (67.4)</u>	<u>\$ (54.0)</u>	<u>\$ (39.4)</u>	<u>\$ (24.5)</u>

15

16 **Q. How does Duquesne Light determine its level of pension cash contributions?**

17 A. Duquesne Light’s contributions to its pension plan are typically the larger of either  
18 the minimum amount required under the Pension Protection Act of 2006 (“PPA”)  
19 or the amount required to fulfill regulatory commitments. However, in the event  
20 that a PPA determined minimum amount is zero, the Company also reviews the  
21 opportunity to make voluntary pension contributions in order to offset service costs

1 as to not degrade the pension plan's funded status and to continue to foster the  
2 Company's de-risking strategies.

3 **Q. What are Duquesne Light's projected pension contributions for the next 6**  
4 **years?**

5 A. Please see the below table for the Company's projected contributions (in millions).

6

<u>2018</u>	<u>2019</u>	<u>2020</u>	<u>2021</u>	<u>2022</u>	<u>2023</u>
\$23.0	\$10.0	\$10.0	\$10.0	\$10.0	\$10.0

7

8 **Q. Do these projected contributions represent PPA minimum funding**  
9 **requirements?**

10 A. No. Based on currently projected pension plan funding levels, the Company is  
11 not required to make any minimum pension plan contributions until 2025.

12 Projected pension plan contributions for inclusion in this rate filing represent  
13 voluntary pension contributions in order to offset service costs as to not degrade  
14 the pension plan's funded status and to continue to foster the Company's de-  
15 risking strategies.

16 **Q. How have accounting changes affected the Company's pension plan?**

17 A. The Company's accounting changes to its pension plan are described in data filing  
18 requirement II-D-12.

19 **Q. What level of pension funding is the Company requesting in this case?**

20 A. Consistent with its 2013 distribution rate case settlement agreement, the Company  
21 has incorporated a three year (2019-2021) average into its ratemaking calculations

1 for the portion of contributions that will be recovered as an expense for ratemaking  
2 purposes. Mr. Robert O'Brien explains this calculation in his testimony.

3 **Q. Why is the Company requesting a three-year projected average for pension**  
4 **funding and not a six year average?**

5 A. Three years was selected as the most appropriate average because it is consistent  
6 with the typical and anticipated timing between distribution rate cases.

7 **Q. How is Duquesne Light's pension plan managed?**

8 A. Duquesne Light's Board of Directors periodically reviews the Plan's ongoing  
9 performance and approves any changes to the Plan's allocation targets between  
10 investment categories to ensure the portfolio is properly diversified. Plan  
11 performance is evaluated by reviewing the performance of individual money  
12 managers against established benchmarks. The Board delegates responsibility for  
13 implementing the approved allocation to a group of executives that compose the  
14 Pension Investment Committee. This Committee meets on a regular basis to review  
15 investment performance, interview managers of funds in which the Plan is invested  
16 and make the day to day decisions involved in managing the pension plan's  
17 investment portfolio. The Committee utilizes an outside investment advisory firm,  
18 LCG Associates, Inc., to provide technical analysis and administrative support in  
19 its work. Please refer to the testimony of Mr. James H. Milligan (DLC Statement  
20 No. 13) for additional information on the Pension Investment Committee.

21 **Q. What steps has Duquesne Light taken to minimize pension costs?**

22 A. In 2007, the Company amended the Plan such that non-represented employees hired  
23 after June 1, 2007 would not be eligible to participate in the Company's defined

1 benefit pension plan. In 2010, the Company amended the Plan such that  
2 represented employees hired on or after October 1, 2010 would not be eligible to  
3 participate in the Company's pension plan. These two amendments effectively  
4 closed the plan to new participants. Employees hired after these dates receive  
5 expanded levels of Company matching under the Company's defined contribution  
6 retirement fund in lieu of pension benefits.

7 **Q. Is the Company taking steps to reduce the investment risk associated with its**  
8 **pension trust?**

9 A. Yes, we are. The Company is implementing a Liability Driven Investing ("LDI")  
10 strategy to mitigate the volatility associated with pension plan funding. LDI is an  
11 investment strategy that focuses on managing pension assets in relation to pension  
12 liabilities. The overall goal of LDI is to minimize the volatility of Plan funded  
13 status, and thus contribution volatility, by investing in long duration fixed income  
14 strategies that attempt to better match the duration of the Plan's liabilities. Please  
15 refer to the testimony of Mr. James Milligan for further discussion of the  
16 Company's LDI strategy.

17 **Q. Why is it appropriate to take these steps?**

18 A. Reduced volatility in the pension plan funded status and pension plan funding will  
19 provide greater predictability to the Company's cash management and capital  
20 planning and ultimately provide for more stable rates for customers.

21  
22

1 **Q. Has Duquesne Light made the pension contributions under the terms of its**  
2 **2013 Distribution Rate Case Settlement?**

3 A. Yes. The Company is required by its 2013 distribution rate case settlement to fund  
4 the pension trust in an amount equal to \$37.2 million per year; provided, however,  
5 contributions in any year in excess of the foregoing may be used on a cumulative  
6 basis to satisfy future contribution obligations. The rate case settlement further  
7 concludes that should a pension contribution less than \$37.2 million to the pension  
8 trust be appropriate, the Company may reduce the pension contribution and record  
9 a regulatory liability on its books that is equal to 50% of the reduction to the pension  
10 contribution below the level of \$37.2 million. If a regulatory liability remains at the  
11 time of the Company's next rate proceeding, the amount will be refunded to rate  
12 payers as part of the next rate case proceeding. The Company made pension  
13 contributions totaling \$162.8 million in the years 2014 through 2017. The  
14 Company plans to make pension contributions of \$23.0 million in 2018. This  
15 represents an average annual pension contribution of \$37.2 million over the last  
16 five years and therefore the Company will have no outstanding regulatory liability  
17 balance owed to rate payers as the end of the Future Test Year.

18 **Q. What pension plan contribution commitment is the Company making with**  
19 **regard to its claim?**

20 A. The Company commits to making pension contributions based on the three-year  
21 average (2019-2021) on a cumulative basis.

22



1 **Q. Is the Company claiming the actuarially determined net periodic pension cost**  
2 **for pensions in this rate proceeding?**

3 A. No, we are not. Consistent with our 2006, 2010 and 2013 distribution rate cases,  
4 we are requesting recovery of the expense component of the annual contributions  
5 that we plan to make to the pension plan. These contributions reflect voluntary  
6 pension contributions in order to offset service costs as to not degrade the pension  
7 plan's funded status and to continue to foster the Company's de-risking strategies.  
8 Therefore the expense claim for pensions in this proceeding is based on projected  
9 pension plan voluntary contributions. The criteria used to determine these  
10 contributions are different from the criteria required to be used to determine pension  
11 costs under ASC 715.

12 **Q. Please explain the proposed future accounting treatment with regard to**  
13 **pensions.**

14 A. The Company is required to accrue an amount for pension costs each year  
15 determined in accordance with ASC 715. While the procedures used to determine  
16 the annual ASC 715 expense will ultimately equal the total contributions over the  
17 duration of the plan, the annual accrual will differ from the pension contribution on  
18 a year-to-year basis. For this reason, the Company requests that the Commission  
19 authorize the Company to record annually the difference between the pension  
20 reimbursement received in rates and the ASC 715 pension expense as either a  
21 regulatory asset or liability. These amounts will then be reversed over time in the  
22 future. The Company records ASC 715 capitalized pension amounts as part of the  
23 previously discussed employee benefit allocation. Please refer to Mr. Robert

1 O'Brien's testimony for further discussion the Company's capitalized pension  
2 amounts.

3 **Q. Is there a specific provision that should be included in the Commission's final**  
4 **order related to pensions?**

5 A. Yes, the provision is as follows:

6 "Commencing with calendar year 2019, Duquesne Light will deposit into its  
7 pension trusts an amount equal to \$10,000,000 per year; provided, however, that  
8 contribution(s) in any year in excess of the foregoing may be used on a cumulative  
9 basis to satisfy future contribution obligations. The provision provides for recovery  
10 of the expense component of \$5,000,000 (50% of the average cash contributions)  
11 of projected future pension contributions. Additionally, Duquesne Light will be  
12 permitted to include the other 50% of actual pension contributions from January 1,  
13 2007, forward, net of related accumulated deferred income taxes, in rate base for  
14 rate making purposes. The rate base adjustment for pensions shall be the amount  
15 necessary to adjust the ASC 715 capitalized pension amounts to equal accumulated  
16 capitalized pension contributions, net of applicable deferred income taxes, from  
17 January 1, 2007 forward. The depreciation expense for book and ratemaking  
18 purposes will be based on the ASC 715 capitalized amounts. The adjusted amounts  
19 will be used for reporting rate base in reports to the Commission.

20 **Q. What other postretirement benefits ("OPEBs") does Duquesne Light provide**  
21 **to its employees?**

22 A. In addition to pension benefits, the Company provides certain healthcare benefits  
23 and life insurance for retired employees hired before October 1, 2010. The retiree

1 life insurance plan is non-contributory. Retirees participating in the health care  
2 plan do make contributions, which have increased as part of our efforts to control  
3 costs. Health care benefits terminate when a retiree reaches age 65. We currently  
4 account for and fund OPEBs through a Voluntary Employees Beneficiary  
5 Associated (VEBA) trust, into which we deposit the full amount of annual costs  
6 calculated by our actuary pursuant to ASC 715. Retiree OPEBs and administrative  
7 costs of maintaining the trusts and/or accounts are paid from the amounts deposited  
8 in the trust. The Company accrues the actuarially determined costs of the  
9 aforementioned postretirement benefits over the period from the date of hire until  
10 the date the employee becomes fully eligible for benefits.

11 **Q. How have accounting changes impacted the Company's postretirement**  
12 **benefits?**

13 A. The Company's accounting changes to its postretirement benefits are described in  
14 data filing requirement II-D-12.

15 **Q. Are you claiming the actuarially determined net periodic cost for**  
16 **postretirement benefits in this rate proceeding?**

17 A. Yes we are. The Company has incorporated a two year average into its ratemaking  
18 calculations for the portion of actuarially determined net periodic cost for  
19 postretirement benefits that will be recovered as an expense for ratemaking  
20 purposes. Two years was selected to be consistent with the treatment in its last  
21 distribution rate case settlement.

1 **Q. Is Duquesne Light requesting that the difference between the rate allowance**  
2 **and the annual OPEB expense accrual be deferred as a regulatory asset or**  
3 **liability?**

4 A. Yes. Any difference between the annual book accrual and the ratemaking  
5 allowance will be deferred and amortized over a reasonable period as an increase  
6 or decrease to the rate allowance for OPEBs in the next rate proceeding. This  
7 procedure is consistent with the Commission's requirement that the rate allowance  
8 be placed in the trust without regard to the actual annual accrual. As of December  
9 31, 2017, the Company had recorded a regulatory liability of approximately \$2.6  
10 million related to OPEBs. The Company has amortized this amount over a three  
11 year period in its ratemaking calculations. As explained in Mr. Robert O'Brien's  
12 testimony, three year period was selected as it is consistent with the typical and  
13 anticipated timing between distribution rate cases.

14 **Q. Is there specific language that should be included in the Commission's final**  
15 **order on the subject of OPEBs?**

16 A. Yes, Duquesne asks for the same treatment as its last distribution case when the  
17 following provision was adopted:

18 "The Company accounts for and funds OPEBs through a Voluntary Employees  
19 Beneficiary Associated (VEBA) trust, into which it will deposit the full amount of  
20 annual costs calculated by the Company's actuary pursuant to ASC 715. Retiree  
21 OPEBs and administrative costs of maintaining the trusts and/or accounts are paid  
22 from amounts deposited. The Company accounts for the difference between the  
23 net periodic postretirement benefit expense determined annually by the actuary in

1 accordance with ASC 715 and the amount of ASC 715 postretirement benefit  
2 expense reimbursement used to establish rates. That difference is recorded as a  
3 regulatory asset or liability and will be expensed or credited in future rate  
4 proceedings in determining OPEB expense included in rates.”

5 **Q. How do you budget for depreciation expense?**

6 A. Our Asset Accounting Department prepares the budget for depreciation and  
7 amortization expense based on current property, plant and equipment accounts and  
8 projected capital expenditures and retirements, including estimated in-service  
9 dates, for the coming year.

10 **Q. How are income taxes and taxes other than income taxes budgeted?**

11 A. Our Tax Department performs calculations to project income taxes and each type  
12 of taxes other than income taxes for budgeting purposes. Budgeted pre-tax book  
13 income is used to project income taxes based on statutory tax rates. The process of  
14 budgeting taxes other than income differs based on the type of tax. Gross receipts  
15 tax is based on estimated taxable revenues multiplied by the expected tax rate,  
16 projected to be 59 mills in 2017, 2018 and 2019. The Public Utility Realty Tax  
17 (“PURTA”) and other real estate taxes are budgeted based on the amounts paid in  
18 the prior year, adjusted for any major additions or sales of real estate property.  
19 Payroll taxes are budgeted based on the expected tax rates applied against the  
20 estimated payroll costs to be incurred. Miscellaneous taxes are budgeted based on  
21 the expected amounts expected to be incurred for items such as sales and use tax  
22 audits.

23

1 **Q. Has tax reform been reflected in the Company's claim?**

2 A. Yes it has. Please refer to the testimony of Mr. Matthew L. Simpson (DLC  
3 Statement No. 11) for additional details.

4 **Q. Please describe how interest expense and the amortization of debt discounts  
5 are calculated for the budget.**

6 A. Our Treasury Department calculates the interest and preferred dividend costs by  
7 multiplying the outstanding debt and preferred stock balances by the applicable  
8 interest and dividend rates. Annual amortization expense is determined by dividing  
9 the original unamortized balance of costs and premiums by the original life of the  
10 debt issuance. New financings are modeled into the budget when capital  
11 requirements exceed cash sources. The expected costs for these new financings,  
12 such as the expected interest rates and costs to be incurred are provided by outside  
13 financial institutions.

14 **Q. Please provide a general description of the process used by the Company to  
15 determine its distribution revenue requirement.**

16 A. The Company first developed the 2018 and 2019 budget for construction  
17 expenditures, operating revenues, operating expenses and other elements. Next,  
18 each of the budget elements were analyzed to determine where pro forma  
19 adjustments would be required to reflect the Future Test Year or Fully Projected  
20 Future Test Year under normalized conditions. The pro forma results for the Future  
21 Test Year and the Fully Projected Future Test year were used to prepare a  
22 jurisdictional separation to show the distribution plant, revenue and expenses for  
23 the Company's Pennsylvania jurisdiction only.

1 **Q. Can you provide more detail on the overall process you described?**

2 A. Yes, I can. I will use the operating budget as the example, but each of the measures  
3 of value, revenue and expense elements were determined following the same basic  
4 procedures. I was responsible for the development of the overall Duquesne Light  
5 budget for the Fully Projected Future Test Year. With regard to the operating  
6 expenses, Mr. Robert O'Brien converted the Company's fully projected future test  
7 year budget from the cost element format that we use, to a FERC format, which is  
8 presented on DLC Exhibit 2, Schedule B-4 and included on DLC Exhibit 2,  
9 Schedule D-2. Mr. Robert O'Brien, working with myself and other Company  
10 personnel, developed pro forma adjustments to the budget expenses by cost  
11 element, as shown on DLC Exhibit 2, Schedules D-7 through D-15. Each of these  
12 adjustments was distributed to the appropriate FERC account as shown on DLC  
13 Exhibit 2, Schedule D-3. These processes provided a total Duquesne Light pro  
14 forma level of expenses by FERC accounts for the fully projected future test year  
15 ending December 31, 2019. Mr. Howard Gorman then used these pro forma  
16 expenses in preparation of his Jurisdictional Separation Study, which is  
17 summarized on DLC Exhibit 2, Schedules C-1 and D-1.

18 **Q. Was this process followed for each of the elements included in the Company's**  
19 **revenue requirement presentation?**

20 A. Yes it was. For example, Mr. Robert O'Brien used the Company's budget for  
21 construction expenditures, construction closed to plant, plant retirements,  
22 depreciation expense, and other measures of value components as a starting point  
23 for pro forma adjustments. The resulting total Company pro forma measures of

1 value was used by Mr. Howard Gorman in his Jurisdictional Separation Study to  
2 determine the amounts for the Pennsylvania jurisdiction. A comparison of the total  
3 Company and Pennsylvania jurisdictional pro forma measure of value amounts is  
4 shown on DLC Exhibit 2, Schedule D-1, page 3. In addition, Mr. Robert O'Brien  
5 used the Company's budget calculation for depreciation expense and made pro  
6 forma adjustments to reflect the use of the year-end plant in service for the Fully  
7 Projected Future Test Year ending December 31, 2019, using the depreciation rates  
8 recommended by Mr. John Spanos and pro forma plant additions to determine the  
9 total pro forma depreciation expense for the total Company. Mr. Howard Gorman  
10 used this data to determine the portion assigned to the Pennsylvania jurisdiction on  
11 a pro forma basis for the test year.

12 **Q. Please briefly describe the process used to calculate the pro forma**  
13 **jurisdictional measure of value, net operating income and required revenue**  
14 **increase for the Pennsylvania jurisdiction.**

15 A. The process began with the Company's 2018 and 2019 calendar year budgets by  
16 cost elements, which are determined by total Company requirements and can be  
17 compared to budget and recorded amounts from prior years. The budgeted cost  
18 elements were then distributed to FERC accounts where necessary. Pro forma  
19 adjustments were made to the Company's budget amounts that allow for easy  
20 comparison for each adjustment. Finally, the total pro forma amounts were  
21 separated to the Pennsylvania jurisdictional level in the aggregate as opposed to  
22 making this calculation for each budget element and each pro forma adjustment.



1 **Q. Please describe how the Company's request for an increase in its electric**  
2 **distribution rates is supported by your data.**

3 A. The requested increase is supported by the Company's budgeted financial data. In  
4 Schedule C-1 and D-1 of DLC Exhibit 2, we summarize the revenues, expenses,  
5 rate base, and deficiencies in revenue for the Fully Projected Future Test Year.  
6 Duquesne Light is requesting an overall distribution rate increase for the total  
7 Pennsylvania Jurisdiction of \$81.6 million. Duquesne Light's capital structure is  
8 shown in DLC Exhibit 2, Schedule B-8, with the requested return on equity of  
9 10.95% reflected on DLC Exhibit 2, Schedule B-9.

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

11 A. Yes, it does.

<u>CITATION</u>	<u>DESCRIPTION</u>
<b>53.53 I</b>	<b>GENERAL FILING INFORMATION</b>
<b>53.53 I A</b>	<b>Summary of Filing</b>
53.53-A-3	Summary Tables
53.53-A-4	Generation Plant additions
<b>53.53 I B</b>	<b>General Description of Operations</b>
53.53-B-1	Corporate History
53.53-B-2	Description of the property of utilities
53.53-B-2a	Schedule of generating capability
53.53-B-2b	Generation outages
53.53-B-2c	Generation retirements
53.53-B-2d	Projected generation additions and retirements
<b>53.53 II</b>	<b>PRIMARY STATEMENTS OF RATE BASE &amp; OPERATING INCOME</b>
<b>53.53 II A</b>	<b>Rate Base</b>
53.53-II-A-1	Test Year rate base and rates of return – future
53.53-II-A-2	Test year rate base and rates of return – historic
53.53-II-A-3	Generation cost information
<b>53.53 II B</b>	<b>Rate Base Supporting Schedules</b>
53.53-II-B-1	Plant held for Future Use
53.53-II-B-2	Construction Work In Progress
53.53-II-B-3	Claim for materials and supplies
53.53-II-B-6	Additional Items in Measure Of Value
<b>53.53 II C</b>	<b>Operating Income Statement</b>
53.53-II-C-1a	Budgeted Income Statement
53.53-II-C-1c	Income Statement present rates after adjustments
53.53-II-C-1d	Adjustment for revenue increase
53.53-II-C-1e	Income Statement requested rates
53.53-II-C-2	Similar schedule historic test year
<b>53.53 II D</b>	<b>Income Statement Supporting Schedules</b>
53.53-II-D-1	Schedule of revenues & expenses for FTY& HTY & variance explanation
53.53-II-D-2	Summary of test year adjustments

<u>CITATION</u>	<u>DESCRIPTION</u>
53.53-II-D-3	Nonrecurring & extraordinary items
53.53-II-D-4	Extraordinary property losses
53.53-II-D-5	Reserve for uncollectible
53.53-II-D-6	Claim for rate case expense
53.53-II-D-7a	Miscellaneous general expenses
53.53-II-D-7b	Outside service expenses
53.53-II-D-7c	Regulatory commission expenses
53.53-II-D-7d	Advertising expenses
53.53-II-D-7e	Research and Development
53.53-II-D-7f	Charitable and civic contributions
53.53-II-D-8	Affiliate charges for FTY and HTY
53.53-II-D-9	Social and Service organization memberships
53.53-II-D-10a	Avg & year-end # of employees & payroll & benefit expense – union
53.53-II-D-10b	Avg & year-end # of employees & payroll & benefit expense - non-union
53.53-II-D-10cc	Avg & year-end # of employees & payroll & benefit expense - mgt
53.53-II-D-10d	Wage rate, salary & benefit changes
53.53-II-D-10e	Claimed test year expense and employee benefit expense
53.53-II-D-10f	Percentage of O&M portion and basis
53.53-II-D-11	Leasing costs and method for calculating
53.53-II-D-12	Past & anticipated accounting changes & internal/external audit reports
53.53-II-D-13	Gross salvage, CR, net salvage for 4 previous years
53.53-II-D-26	Other items
<b>53.53 II E</b>	<b>Budgeted Data</b>
53.53-II-E-1	Copies of budgets & explanation of process
53.53-II-E-2	Budgets (operating & capital) for 3 years
<b>53.53-III</b>	<b>RATE OF RETURN</b>
<b>53.53-III-E</b>	<b>Parent - Subsidiary Relationship</b>
53.53-III-E-3	Balance sheet and income statement consolidated/parent
53.53-III-E-4	Organizational chart
<b>53.53-III-F</b>	<b>General Financial Data</b>
53.53-III-F-1	Quarterly and annual reports

**CITATION**

53.53-III-F-2

**53.53-V**

**53.53-V-A**

53.53-V-A-1

53.53-V-A-3

53.53-V-A-4

**53.53-VI**

53.53-VI-a

53.53-VI-b

53.53-VI-c

53.53-VI-d

**DESCRIPTION**

Projected capital requirements and sources

**PLANT & DEPRECIATION**

**Adjusted original cost with accumulated depreciation**

Schedule of plant in service by function

Supporting schedules

Schedule of rate case adjustments

**UNADJUSTED BALANCE SHEETS AND INCOME STATEMENTS**

Balance sheet - 3 years

Income Statement - 3 years

Plant in Service - 3 years

Accumulated depreciation - 3 years

**Cost Elements**

<b><u>Cost Element</u></b>	<b><u>Description</u></b>
10	Labor
11	Overtime Labor
12	Paid for Time Not Worked
14	Rent
15	Incentive Compensation
20	Stores Issues and Returns
22	Materials Purchased by Contractors
23	Materials Purchased
24	Utilities
30	Transportation
40	Telephone Services
42	Other Rent
43	Data Processing Leases
44	Insurance
45	Mobile Phone / Pager Costs
49	Regulatory Assessment & Fees
50	Healthcare & Misc. Benefits
51	Employee Expenses
52	Community Relations
53	Surcharge Revenue Offset
54	Pole Attachment Fees
55	Fiber Lease & Sonet Network – DQE Comm
56	DataCom Service Fees
57	Outside Engineering Services
58	Consulting Services
59	Outside Services
60	Pension Costs
61	Transmission Expenses
65	Uncollectible Accounts
66	Deferred Cost
67	Reimbursements
70	Social Security & Unemployment Taxes
72	Mailing Costs
75	Memberships / Dues
76	Business Meals
88	Subsidiary Reimbursements
99	Miscellaneous

<u>Organization</u>	<u>Cost Center</u>	<u>Cost Center Name</u>
Office of CEO	001	Office of the CEO
	032	Media & Community Relations
	400	Senior VP & CFO
Customer Care	019	VP Customer Care
	030	Credit & Collections
	310	Universal Services Surcharge
	480	Energy Efficiency & Demand Reduction
	489	Business Performance
	490	Call Center
	491	Retail Market Enhancement
	493	Customer Experience
	494	AMI
	495	Universal Services
	496	Customer Billing
	497	Payment Processing
	498	Business Development
	499	Metering
	847	Commercial & Industrial Customers
General Counsel, Rate & Regulatory Affairs	002	Risk Management
	003	Internal Audit
	004	Regulatory Legal
	005	VP Office of General Counsel
	006	Commercial
	007	Compliance Services
	010	Regulatory and Consumer Relations
	034	Litigation
	040	Governmental Affairs
	050	Labor & Employment
	460	Federal & RTO Affairs
	465	Supply Procurement & Settlement
	470	Rates & Tariff Services
	492	State Regulatory Affairs
Human Resources	300	VP of Human Resources
	301	Employee & Labor Relations
	302	Talent Development
	500	Talent Acquisition
	512	Total Rewards
	513	Benefits
	571	401k Administration

<u>Organization</u>	<u>Cost Center</u>	<u>Cost Center Name</u>
	573	Wellness
	599	Healthcare / Dental
Information Technology	364	Project Management Office
	445	Corporate Applications
	450	AMI Program
	451	ADMS
	540	Office of the CIO
	541	IT Projects & Service Management
	545	Computing Platforms
	547	Operations Systems
	548	Oracle COE
	560	Information Security
Office of CFO	404	Pension Benefits
	406	Corporate Controller
	407	Tax Reporting
	409	Business Valuation & Analysis
	410	Accounting & Financial Reporting
	422	Accounts Payable & Payroll
	435	FP&A
	437	Workers Compensation
	438	Treasury Operations
	561	Supply Chain Management
	586	Materials Management
Operations	311	Health & Safety
	351	Workforce Development
	502	Vegetation Management
	503	Project Management
	520	Shops & Testing
	530	Property Services
	549	Telecommunications
	565	Real Estate and Rights of Way
	572	Transportation Services
	705	Environmental
	711	Legacy projects
	805	Oper Compliance & Regulatory
	810	Asset Management
	820	Engineering
	830	Work Management & Performance
	832	Maint & Services - Penn Hills
	833	Maint & Services - McKeesport

<u>Organization</u>	<u>Cost Center</u>	<u>Cost Center Name</u>
	838	Maint & Services - Raccoon
	839	Maint & Services - Edison
	840	Operations Center
	845	Maint & Services - Preble
	848	Security Services
	849	Outage Coordination & Field Ops
	850	System Planning & Protection
	852	Substation - Raccoon
	853	Substation - Preble Avenue
	855	Underground
Other		
	008	Allocations to Subsidiaries
	009	RTO Settlements
	096	Corporate Cost center
	101	AFUDC
	860	Purchased Power



**DUQUESNE LIGHT COMPANY**  
**STATEMENT OF INCOME**  
**Operating Budget**

	1st Qtr	2nd Qtr	3rd Qtr	4th Qtr	Total 12 Mos. End 12/31/18
<b>UTILITY OPERATING INCOME</b>					
Operating Revenues (400)	\$ 229,062,626	\$ 217,167,586	\$ 253,707,992	\$ 218,473,861	918,412,065
<b>Operating Expenses</b>					
Operation Expenses (401)	112,452,531	106,096,398	111,100,278	105,269,151	434,918,357
Maintenance Expenses (402)	8,141,448	7,681,270	8,043,546	7,621,379	31,487,643
Depreciation Expense (403)	43,037,328	40,604,737	42,519,799	40,288,136	166,450,000
Amort. & Depl. Of Utility Plant (404-405)	-	-	-	-	-
Regulatory Debits (Credits), net (407 3,407 4)	-	-	-	-	-
Taxes Other Than Income Taxes (408 1)	14,606,835	13,781,216	14,431,187	13,673,762	56,493,000
Income Taxes - Federal (409 1)	2,033,738.85	1,985,699.95	2,889,147.75	2,131,821.53	9,040,408
Income Taxes - Other (409 1)	636,001.37	620,978.36	903,509.42	666,674.14	2,827,163
Provision for Deferred Income Taxes, net (410 1,411 1)	7,976,357.16	7,976,357.16	7,976,357.16	7,976,357.16	31,905,429
Investment Tax Credit, net (411.7)	-	-	-	-	-
<b>Total Utility Operating Expenses</b>	<b>188,884,239</b>	<b>178,746,657</b>	<b>187,863,824</b>	<b>177,627,280</b>	<b>733,122,000</b>
<b>Net Utility Operating Income</b>	<b>40,178,387</b>	<b>38,420,929</b>	<b>65,844,169</b>	<b>40,846,581</b>	<b>185,290,064</b>
<b>OTHER INCOME AND DEDUCTIONS</b>					
<b>Other Income</b>					
Equity in Earnings of Subsidiary Companies (418 1)	-	-	-	-	-
Interest and Dividend Income (419)	-	-	-	-	-
Allowance for Other Funds Used During Construction (419.1)	1,112,080	1,112,080	1,112,080	1,112,080	4,448,318
Miscellaneous Nonoperating Income (421)	-	-	-	-	-
Gain on Disposition of Property (421 1)	-	-	-	-	-
<b>Total Other Income</b>	<b>1,112,080</b>	<b>1,112,080</b>	<b>1,112,080</b>	<b>1,112,080</b>	<b>4,448,318</b>
<b>Other Income Deductions</b>					
Loss on Disposition of Property (421 2)	-	-	-	-	-
Donations (426 1)	1,449,419	370,697	412,207	470,337	2,702,659
Penalties (426 3)	-	-	-	-	-
Exp for Certain Civic, Political, & Related Activities (426 4)	-	-	-	-	-
Other Deductions (426 5)	-	-	-	-	-
<b>Total Other Income Deductions</b>	<b>1,449,419</b>	<b>370,697</b>	<b>412,207</b>	<b>470,337</b>	<b>2,702,659</b>
<b>Taxes Applicable to Other Income and Deductions</b>					
Income Taxes - Federal (409 2)	(225,322)	(220,000)	(320,095)	(236,189.06)	(1,001,606)
Income Taxes - Other (409 2)	(78,385)	(76,534)	(111,355)	(82,166)	(348,439)
Provision for Def Inc Taxes (410 2)	(993,517)	(993,517)	(993,517)	(993,517)	(3,974,066)
(Less) Provision for Def Inc Taxes (411.2)	1,457,108	1,457,108	1,457,108	1,457,108.26	5,828,433
<b>Total Taxes on Other Inc and Ded</b>	<b>159,884</b>	<b>167,058</b>	<b>32,142</b>	<b>145,237</b>	<b>504,321</b>
<b>Net Other Income and Deductions</b>	<b>(497,224)</b>	<b>574,325</b>	<b>667,731</b>	<b>496,506</b>	<b>1,241,339</b>
<b>Interest Charges</b>					
Interest on Long-Term Debt (427)	13,568,257	13,892,456	12,874,875	12,874,875	53,210,464
Amortization of Debt Disc and Expense (428)	88,178	89,886	89,886	89,886	357,837
Amortization of Loss on Reacquired Debt (428 1)	559,402	538,976	525,740	509,312	2,133,431
Amortization of Premium on Debt - Credit (429)	-	-	-	-	-
Amortization of Gain on Reacquired Debt - Credit (429 1)	-	-	-	-	-
Interest on Debt to Assoc Companies (430)	-	-	-	-	-
Other Interest Expense (431)	438,083	372,124	375,146	487,046	1,672,399
Allowance for Borrowed Funds Used During Construction-Cr (432)	(469,792)	(469,792)	(469,792)	(469,792)	(1,879,170)
<b>Net Interest Charges</b>	<b>14,184,128</b>	<b>14,423,650</b>	<b>13,395,855</b>	<b>13,491,327</b>	<b>55,494,960</b>
<b>Net Income</b>	<b>\$ 25,497,035</b>	<b>\$ 24,571,604</b>	<b>\$ 53,116,045</b>	<b>\$ 27,851,759</b>	<b>\$ 131,036,443</b>

**DUQUESNE LIGHT COMPANY**  
**STATEMENT OF INCOME**  
**Operating Budget**

	1st Qtr	2nd Qtr	3rd Qtr	4th Qtr	Total 12 Mos. End 12/31/19
<b>UTILITY OPERATING INCOME</b>					
Operating Revenues (400)	\$ 226,735,390	\$ 212,068,042	\$ 242,245,229	\$ 208,326,007	889,374,667
<b>Operating Expenses</b>					
Operation Expenses (401)	106,692,577	101,488,942	107,972,858	101,852,144	418,006,522
Maintenance Expenses (402)	10,678,229	10,157,428	10,806,365	10,193,779	41,835,800
Depreciation Expense (403)	45,191,259	42,987,180	45,733,541	43,141,020	177,053,000
Amort & Depl Of Utility Plant (404-405)	-	-	-	-	-
Regulatory Debits (Credits), net (407 3,407 4)	-	-	-	-	-
Taxes Other Than Income Taxes (408.1)	14,066,865	13,380,793	14,235,663	13,428,679	55,112,000
Income Taxes - Federal (409 1)	1,275,534	1,324,741	1,881,780	1,589,908	6,071,962
Income Taxes - Other (409 1)	398,891	403,373	588,480	508,111	1,898,855
Provision for Deferred Income Taxes, net (410 1,411 1)	5,357,296	5,357,296	5,357,296	5,357,296	21,429,182
Investment Tax Credit, net (411 7)	-	-	-	-	-
Total Utility Operating Expenses	<u>183,660,651</u>	<u>175,099,752</u>	<u>186,575,982</u>	<u>176,070,937</u>	<u>721,407,322</u>
<b>Net Utility Operating Income</b>	<u>43,074,739</u>	<u>36,968,290</u>	<u>55,669,247</u>	<u>32,255,070</u>	<u>167,967,345</u>
<b>OTHER INCOME AND DEDUCTIONS</b>					
<b>Other Income</b>					
Equity in Earnings of Subsidiary Companies (418.1)	-	-	-	-	-
Interest and Dividend Income (419)	-	-	-	-	-
Allowance for Other Funds Used During Construction (419 1)	1,254,587	1,254,587	1,254,587	1,254,587	5,018,349
Miscellaneous Nonoperating Income (421)	-	-	-	-	-
Gain on Disposition of Property (421.1)	-	-	-	-	-
Total Other Income	<u>1,254,587</u>	<u>1,254,587</u>	<u>1,254,587</u>	<u>1,254,587</u>	<u>5,018,349</u>
<b>Other Income Deductions</b>					
Loss on Disposition of Property (421 2)	-	-	-	-	-
Donations (426 1)	1,464,472	373,749	415,509	473,389	2,727,118
Penalties (426.3)	-	-	-	-	-
Exp for Certain Civic, Political, & Related Activities (426 4)	-	-	-	-	-
Other Deductions (426 5)	-	-	-	-	-
Total Other Income Deductions	<u>1,464,472</u>	<u>373,749</u>	<u>415,509</u>	<u>473,389</u>	<u>2,727,118</u>
<b>Taxes Applicable to Other Income and Deductions</b>					
Income Taxes - Federal (409.2)	(276,165)	(286,819)	(407,423)	(344,230)	(1,314,638)
Income Taxes - Other (409 2)	(96,073)	(97,152)	(141,735)	(122,378)	(457,337)
Provision for Def. Inc. Taxes (410 2)	(1,304,020)	(1,304,020)	(1,304,020)	(1,304,020)	(5,216,082)
(Less) Provision for Def Inc Taxes (411 2)	1,912,499	1,912,499	1,912,499	1,912,499	7,649,994
Total Taxes on Other Inc and Ded.	<u>236,240</u>	<u>224,507</u>	<u>59,320</u>	<u>141,870</u>	<u>661,937</u>
<b>Net Other Income and Deductions</b>	<u>(446,125)</u>	<u>656,332</u>	<u>779,758</u>	<u>639,329</u>	<u>1,629,294</u>
<b>Interest Charges</b>					
Interest on Long-Term Debt (427)	13,022,000	13,022,000	13,022,000	13,022,000	52,088,000
Amortization of Debt Disc and Expense (428)	89,886	451,915	122,325	122,325	786,452
Amortization of Loss on Reacquired Debt (428 1)	509,312	509,312	509,312	509,312	2,037,249
Amortization of Premium on Debt - Credit (429)	-	-	-	-	-
Amortization of Gain on Reacquired Debt - Credit (429.1)	-	-	-	-	-
Interest on Debt to Assoc Companies (430)	-	-	35,500	35,500	71,000
Other Interest Expense (431)	581,896	618,661	633,548	674,638	2,508,744
Allowance for Borrowed Funds Used During Construction-Cr (432)	(529,994)	(529,994)	(529,994)	(529,994)	(2,119,976)
Net Interest Charges	<u>13,673,100</u>	<u>14,071,894</u>	<u>13,792,692</u>	<u>13,833,782</u>	<u>55,371,469</u>
<b>Net Income</b>	<u>\$ 28,955,514</u>	<u>\$ 23,552,727</u>	<u>\$ 42,656,313</u>	<u>\$ 19,060,617</u>	<u>\$ 114,225,171</u>

Exhibit MSA-5

Page 1 of 2

**OPERATION AND MAINTENANCE EXPENSES**

12 MONTHS ENDED APRIL 30, 2015

ACTUALS VS. FULLY PROJECTED FUTURE TEST YEAR

(\$ IN THOUSANDS)

Line No	Description	Account No.	Actual	Forecast FPFTY	Variance
<b>Purchased Power Expenses:</b>					
1	Purchased Power	555	\$ 239,646	\$ 116,326	\$ 123,320
3	Total Purchased Power Expenses		239,646	116,326	123,320
<b>Transmission Expense:</b>					
4	Operation Supervision & Engineering	560	1,115	1,553	(438)
5	Load Dispatching	561	1,113	-	1,113
6	Station Expenses	562	159	210	(51)
7	Overhead Line Expenses	563	314	1,071	(757)
8	Underground Line Expenses	564	159	184	(25)
9	Transmission of Electricity by Others	565	-	-	-
10	Miscellaneous Transmission Expenses	566	2,707	2,150	557
11	Rents	567	-	-	-
12	Maintenance Supervision & Engineering	568	334	425	(91)
13	Maintenance of Structures	569	355	39	316
14	Maintenance of Station Equipment	570	2,069	1,799	270
15	Overhead Lines	571	2,431	1,502	929
16	Underground Lines	572	-	-	-
17	Miscellaneous Maintenance & Repair	573	351	111	240
18	Total Transmission Expenses		11,104	9,044	2,060
<b>Distribution Expense:</b>					
19	Operation Supervision & Engineering	580	3,967	3,404	563
20	Load Dispatching	581	1,063	898	165
21	Station Expenses	582	279	369	(90)
22	Overhead Line Expense	583	764	1,305	(541)
23	Underground Line Expense	584	306	682	(376)
24	Street Lighting & Signal Systems	585	-	-	-
25	Meter Expenses	586	1,280	473	807
26	Customer Installations Expense	587	0	3	(3)
27	Miscellaneous Expenses	588	7,107	8,126	(1,019)
28	Rents	589	-	-	-
29	Total Distribution Operation Expenses		14,765	15,260	(495)
30	Maintenance Supervision & Engineering	590	51	551	(500)
31	Maintenance of Structures	591	178	234	(56)
32	Maintenance of Station Equipment	592	2,409	2,552	(143)
33	Maintenance of OH lines	593	25,076	17,980	7,096
34	Maintenance of Underground lines	594	1,580	1,161	419
35	Maintenance of Line Transformers	595	62	23	39
36	Maintenance of Street Lighting & Signals	596	419	544	(125)
37	Maintenance of Meters	597	1,198	1,042	156
38	Maintenance of Miscellaneous Plant	598	182	173	9
39	Total Distribution Maintenance Expenses		31,156	24,260	6,896
40	Total Distribution Expenses		45,921	39,520	6,401

**OPERATION AND MAINTENANCE EXPENSES**

12 MONTHS ENDED APRIL 30, 2015

ACTUALS VS. FULLY PROJECTED FUTURE TEST YEAR

(\$ IN THOUSANDS)

Line No	Description	Account No.	Actual	Forecast FPFTY	Variance
<b>Customer Accounting Expense:</b>					
41	Supervision	901	4,243	3,039	1,204
42	Customer Assistance	902	3,549	3,593	(44)
43	Records & Collections	903	11,861	35,858	(23,997)
44	Uncollectible Accounts	904	15,087	7,296	7,791
45	Miscellaneous Expenses	905	-	-	-
46	Total Customer Accounts Expense		34,740	49,786	(15,046)
<b>Customer Services Expense:</b>					
47	Customer Service-Supervision	907	-	-	-
48	Customer Service-Customer Assistance	908	68	3,412	(3,344)
49	Customer Service-Information and Instruction	909	-	-	-
50	Customer Service-Miscellaneous Service & Info	910	-	-	-
51	Total Customer Service & Informational Expenses		68	3,412	(3,344)
<b>Sales Expense:</b>					
52	Supervision	911	-	-	-
53	Demonstration and Selling Expenses	912	-	-	-
54	Advertising Expenses	913	-	-	-
55	Miscellaneous Sales Expenses	914	-	-	-
56	Total Sales Expense		-	-	-
<b>Administrative &amp; General Expenses:</b>					
57	Administrative and General Salaries	920	26,850	22,621	4,229
58	Office Supplies and Expenses	921	6,172	5,367	805
59	Administrative Expenses Transferred - Credit	922	-	-	-
60	Outside Services Employed	923	22,061	12,912	9,149
61	Property Insurance	924	5,683	5,673	10
62	Injuries and Damages	925	1,572	-	1,572
63	Employee Pension and Benefits	926	27,050	30,337	(3,287)
64	Regulatory Commission Expenses	928	3,462	1,802	1,660
65	General Advertising Expenses	930.1	1,223	344	879
66	Miscellaneous General Expenses	930.2	11,888	3,344	8,544
67	Rents	931	3,196	2,927	269
68	Total Operation		109,158	85,327	23,831
69	Maintenance of General Plant	935	11,226	12,632	(1,406)
70	Total Administrative and General Expenses		120,385	97,959	22,426
71	<b>TOTAL OPERATION &amp; MAINTENANCE EXPENSES</b>		<b>\$ 451,864</b>	<b>\$ 316,047</b>	<b>\$ 135,817</b>

# Exhibit MSA-6

Page 1 of 1

Duquesne Light Company  
 Fully Projected Future Test Year - 12 Months Ended April 30, 2015  
 ADDITIONS TO PLANT  
 05/01/14 to 4/30/15  
 (\$ IN THOUSANDS)

		12 Months Ended April 30, 2015			
Line #	Description	Account Number	Actual	Forecast FPFTY	Variance
<b>Intangible Plant</b>					
1	Organization	301	-	-	-
2	Franchises and consents	302	-	-	-
3	Misc intangible plant	303	142,457	95,179 *	47,278
4	Total Intangible		142,457	95,179	47,278
<b>Production Plant</b>					
5	Land and land rights	310	-	-	-
6	Structures and Improvements	311	-	-	-
7	Misc power plant equipment	316	-	-	-
8	Total Production Plant		-	-	-
<b>Storage Plant</b>					
9	Land and land rights	340	-	-	-
10	Structures and improvements	341	-	-	-
11	Misc power plant equipment	346	-	-	-
12	Total Storage and Equipment		-	-	-
13	Total Production Plant		142,457	95,179	47,278
<b>Transmission Plant</b>					
14	Land and land rights	350	257	-	257
15	Structures and improvements	352	24	-	24
16	Station equipment	353	24,677	15,392	9,285
17	Towers and fixtures	354	242	4,522	(4,280)
18	Poles and fixtures	355	1,214	181	1,033
19	Overhead conductors, devices	356	8,455	4,242	4,213
20	Underground conduit	357	0	-	0
21	Undergrnd conductors, devices	358	1	-	1
22	Roads and trails	359	26	-	26
23	Total Transmission Plant		34,896	24,337	10,559
<b>Distribution Plant</b>					
24	Land and land rights	360	-	-	-
25	Structures and improvements	361	1,369	-	1,369
26	Station equipment	362	13,166	5,088	8,078
27	Poles, towers and fixtures	364	18,172	18,556	(384)
28	Overhead conductors, devices	365	12,791	18,478	(5,687)
29	Underground conduit	366	4,253	15,082	(10,829)
30	Undergrnd conductors, devices	367	27,988	8,192	19,796
31	Line transformers	368	24,765	23,715	1,050
32	Services	369	2,007	4,346	(2,339)
33	Meters	370	7,237	2,087	5,150
35	Street lighting,signal system	373	1,286	355	931
36	Total Distribution Plant		113,035	95,899	17,136
<b>General Plant</b>					
37	Land and land rights	389	-	-	-
38	Structures and improvements	390	12,977	5,981	6,996
39	Office furniture, equipment	391	1,840	265	1,575
40	Transportation equipment	392	5,320	6,492	(1,172)
41	Stores equipment	393	-	-	-
42	Tools, shop, garage equipment	394	1,307	-	1,307
43	Laboratory equipment	395	2	-	2
44	Power operated equipment	396	274	-	274
45	Communication equipment	397	5,371	5,478	(107)
46	Miscellaneous equipment	398	-	-	-
47	Other tangible property	399	-	-	-
48	Total General Plant		27,091	18,216	8,875
49	<b>Total Additions</b>		<b>317,479</b>	<b>233,631</b>	<b>83,848</b>

\* Includes additions of \$92,309 in April 2014 which were not shown within FTY or FPFTY exhibits in the 2013 rate case

**BEFORE THE  
PENNSYLVANIA PUBLIC UTILITY COMMISSION**

**Docket No. R-2018-3000124**

**Duquesne Light Company**

**DLC Statement No. 3**

**DIRECT TESTIMONY OF TODD A. MOBLEY**

**Subject: Sales Forecast**

**Date: March 28, 2018**

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**DIRECT TESTIMONY OF TODD A. MOBLEY**

- Q. Please state your full name and business address.**
- A. Todd Allen Mobley; 411 Seventh Avenue, 7<sup>th</sup> Floor, Pittsburgh, PA 15219
- Q. What is your position at Duquesne Light Company (“Duquesne Light” or “Company”)?**
- A. Senior Manager, Business Analysis & Valuation
- Q. How long have you worked at Duquesne Light?**
- A. Since June 2014
- Q. What are your current responsibilities?**
- A. In addition to other responsibilities, I manage Duquesne Light’s sales throughput forecasting.
- Q. What are your qualifications, work experience and educational background?**
- A. I have a Bachelor of Science in Mathematics and a Master of Business Administration from the University Of Notre Dame, including classes in statistics, probability, and regression modeling and forecasting. Beyond my current position, relevant work experience includes three-plus years as a Quantitative Analyst at Allegheny Energy. Other qualification include industry training through Itron’s Energy Forecasting Group.
- Q. What is the purpose of your direct testimony regarding Duquesne Light’s request for increased rates?**
- A. The purpose of my testimony is to present the Company’s sales forecast and the methodology used in its development.

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

2 A. Yes, I am. I am sponsoring Exhibit TM-1, which is the past five years of weather  
3 normalized Company sales segmented by customer class. I am also sponsoring  
4 Exhibit TM-2, which is the Company's forecast of sales during the Historical Test  
5 Year through 2022, including the Future Test Year and Fully Projected Future  
6 Test Year, also segmented by customer class. Finally, I am sponsoring Exhibit  
7 TM-3, which displays the savings we expect to achieve through the Company's  
8 Act 129 Programs for the period of 2017 through 2022.

9 **Q. Please explain how these exhibits were prepared?**

10 A. These exhibits were prepared by me, starting with Exhibit TM-1, which is based  
11 on weather normalized internal Company sales records. Exhibit TM-2 comes  
12 from the results of the annual forecast models I develop, which will be further  
13 described in this testimony. Lastly, Exhibit TM-3 comes from the Company's  
14 most recent filing detailing our energy efficiency and conservation programs  
15 related to PA Act 129, which was approved by the Public Utility Commission on  
16 March 10, 2016.

17 **Q. Please summarize your findings.**

18 A. The forecast assumes normal temperature patterns for all years. Duquesne Light  
19 control area sales are projected to decline 0.1% between the Historic Test Year  
20 (HTY) and the Future Test Year (FTY). Control area sales are projected to  
21 decline an additional 0.8% between the FTY and the Fully Projected Future Test  
22 Year (FPFTY). Total control area sale are projected to decline at a compound  
23 annual growth rate of 0.8% between the HTY and 2022.



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Residential usage comprises approximately 31% of Duquesne Light’s annual sales, and this segment is expected to decline at a compound annual growth rate of 1.1% between the HTY and 2022. This projected decline is being driven by energy efficiency and net metering trends and is partially offset by projected customer and electric vehicle (EV) growth.

Commercial usage comprises approximately 48% of Duquesne Light’s annual sales, and this segment is expected to decline at a compound annual growth rate of 1.0% between the HTY and 2022. This projected decline is being driven by energy efficiency, net metering trends, and customer count declines, partially offset by growth associated with EV and projected economic activity tied to the Shell cracker plant.

Finally, Industrial usage comprises approximately 21% of Duquesne Light’s annual sales. This segment is expected to decline at a compound annual growth rate of 0.2% between the HTY and 2022. The projected decline is being driven by energy efficiency trends and customer declines, partially offset by projected economic activity tied to the Shell cracker plant.

These forecasts are detailed in Exhibit TM-2.

**Q. What procedures and methodology does Duquesne Light utilize for preparing its forecasts?**

A. I develop the sales forecasts by modeling each rate and customer class separately, using multiple regression. For Residential and Commercial rate classes, I employ Itron’s Statistically Adjusted End-Use (SAE) framework, which captures

1 electricity usage for heating, cooling, and all other end-uses through a series of  
2 composite variables. For Industrial rate classes, I use a multiple regression more  
3 heavily reliant on trend variables.

4 The raw regression forecasts are then adjusted for a handful of external factors,  
5 namely: projected growth in electric vehicles, growth in net metering connections,  
6 the anticipated ancillary economic activity as a result of the Shell cracker plant  
7 being constructed, anticipated adoption of electric buses, and for Industrial rate  
8 classes, projected deemed Act 129 energy efficiency savings. The outcome is a  
9 calendar monthly forecast for kWh and customer count by rate class.

10 **Q. What data do you utilize for the inputs into your forecasts?**

11 A. The main data inputs used in the forecast models and their sources include:

- 12 • Historical kWh sales, customer count, and net metering requests by rate class  
13 provided internally
- 14 • 15 year historical daily temperature for Duquesne Light territory provided by  
15 Air Science Consultants, Inc.
- 16 • Historical and forecasted regional energy efficiency trends provided by Itron  
17 via the Energy Information Administration and calibrated for Duquesne Light  
18 territory specific activity mix using 2014 PA Statewide Act 129 Residential  
19 and Non-Residential Baseline Study
- 20 • Historical and projected Duquesne Light Act 129 program deemed savings for  
21 Industrial customer class
- 22 • Historical and forecasted economic data for Pittsburgh MSA provided by  
23 Oxford Economics

- 1 • Electric Vehicle electricity usage forecast provided by Electric Power
- 2 Research Institute
- 3 • Projected growth rates in solar installations for PA provided by US Solar
- 4 Market Insight report from GTM Research
- 5 • Economic study for Shell cracker plant provided by the Pennsylvania
- 6 Economy League of Greater Pittsburgh

7 **Q. How are Duquesne Light Company's Pa. Act 129 Energy Efficiency and**  
8 **Conservation obligations factored into your forecasts?**

9 A. For Residential and Commercial rate classes, all energy efficiency and  
10 conservations effects are incorporated through Itron's SAE model framework,  
11 which leverages the Energy Information Administration regional forecasts  
12 regarding end use equipment and appliance efficiency and saturation trends.  
13 These regional trends are calibrated to Duquesne Light's mix of electrical end-  
14 uses using 2014 PA Statewide Act 129 Residential and Non-Residential Baseline  
15 Study. For Industrial rate classes, the projected Act 129 deemed savings are  
16 subtracted from the unadjusted forecasts.

17 **Q. Are there any major events impacting the Company's test year forecasts?**

18 A. Major events are addressed through adjustments to the raw regression forecasts  
19 and include: projected growth in electric vehicles, growth in net metering  
20 connections, the anticipated ancillary economic activity as a result of the Shell  
21 cracker plant being constructed, and anticipated adoption of electric buses.

22

23

1   **Q.    Could you explain Duquesne Light Company's peak load demand forecasts?**

2   A.    Our peak load demand forecasts are provided to us by PJM, our Regional  
3        Transmission Organization. PJM develops peak load demand forecasts for each  
4        zone in its territory, and provides these forecasts to its members.

5   **Q    Does this conclude your direct testimony?**

6   A.    Yes, it does.

**Duquesne Light Company**

**Weather Normalized Annual Retail Sales (gWh) by Customer Class**

	2012	2013	2014	2015	2016
Residential	4,137	4,100	4,111	4,022	4,037
Commercial	6,524	6,491	6,460	6,364	6,246
Industrial	3,409	3,336	3,162	2,861	2,562
Lighting	58	57	56	57	56
<b>Total</b>	<b>14,128</b>	<b>13,984</b>	<b>13,789</b>	<b>13,304</b>	<b>12,901</b>

**Year to Year Change by gWh**

	2012	2013	2014	2015	2016
Residential		(37)	11	(89)	15
Commercial		(33)	(31)	(95)	(118)
Industrial		(73)	(173)	(301)	(299)
Lighting		(0)	(1)	0	(1)
<b>Total</b>		<b>(143)</b>	<b>(195)</b>	<b>(485)</b>	<b>(403)</b>

**Year to Year Change by Percentage**

	2012	2013	2014	2015	2016
Residential		-0.9%	0.3%	-2.2%	0.4%
Commercial		-0.5%	-0.5%	-1.5%	-1.9%
Industrial		-2.1%	-5.2%	-9.5%	-10.5%
Lighting		-0.1%	-1.9%	0.5%	-1.2%
<b>Total</b>		<b>-1.0%</b>	<b>-1.4%</b>	<b>-3.5%</b>	<b>-3.0%</b>



**Duquesne Light Company**

**Forecasted Retail Sales (gWh) by Customer Class**

	Historic Test Year	Future Test Year	Fully Projected Future Test Year			
	2017	2018	2019	2020	2021	2022
Residential	3,955	3,949	3,915	3,856	3,797	3,747
Commercial	6,119	6,072	6,024	5,980	5,905	5,833
Industrial	2,638	2,675	2,656	2,650	2,627	2,605
Lighting	53	55	54	54	54	53
<b>Total</b>	<b>12,765</b>	<b>12,750</b>	<b>12,649</b>	<b>12,539</b>	<b>12,382</b>	<b>12,239</b>

**Year to Year Change by gWh**

	Historic Test Year	Future Test Year	Fully Projected Future Test Year			
	2017	2018	2019	2020	2021	2022
Residential	(82)	(6)	(34)	(60)	(59)	(49)
Commercial	(127)	(47)	(48)	(44)	(75)	(71)
Industrial	76	37	(19)	(6)	(23)	(22)
Lighting	(3)	2	(0)	(0)	(0)	(0)
<b>Total</b>	<b>(136)</b>	<b>(15)</b>	<b>(102)</b>	<b>(109)</b>	<b>(158)</b>	<b>(143)</b>

**Year to Year Change by Percentage**

	Historic Test Year	Future Test Year	Fully Projected Future Test Year			
	2017	2018	2019	2020	2021	2022
Residential	-2.0%	-0.1%	-0.9%	-1.5%	-1.5%	-1.3%
Commercial	-2.0%	-0.8%	-0.8%	-0.7%	-1.3%	-1.2%
Industrial	3.0%	1.4%	-0.7%	-0.2%	-0.9%	-0.8%
Lighting	-5.2%	2.9%	-0.6%	-0.6%	-0.7%	-0.7%
<b>Total</b>	<b>-1.1%</b>	<b>-0.1%</b>	<b>-0.8%</b>	<b>-0.9%</b>	<b>-1.3%</b>	<b>-1.2%</b>

Note: Historic Test Year (2017) is weather normalized

**Duquesne Light Company**

**Act 129 Program Savings (gWh) by Customer Class**

	Historic Test Year 2017	Future Test Year 2018	Fully Projected Future Test Year 2019	2020	2021	2022
Residential	39	81	119	159	196	235
Commercial	32	61	93	122	149	176
Industrial	18	37	53	71	87	104
Lighting	-	-	-	-	-	-
<b>Total</b>	<b>89</b>	<b>178</b>	<b>265</b>	<b>351</b>	<b>432</b>	<b>514</b>

Note: Act 129 Program Savings are only directly used in the Industrial forecast

**BEFORE THE  
PENNSYLVANIA PUBLIC UTILITY COMMISSION**

**Docket No. R-2018-3000124**

**Duquesne Light Company**

**DLC Statement No. 4**

**DIRECT TESTIMONY OF BENJAMIN BUXTON MORRIS**

**Subject: Plant Additions, Reliability Performance, and Resilience**

**Date: March 28, 2018**



1                   **DIRECT TESTIMONY OF BENJAMIN BUXTON MORRIS**

2   **I.     INTRODUCTION**

3   **Q.     Please state your full name and business address.**

4   A.     My name is Benjamin Buxton Morris. My business address is 2825 New Beaver  
5           Avenue, Pittsburgh, PA 15233.

6   **Q.     What is your position at Duquesne Light Company?**

7   A.     I am the Director, Operations Work Management & Performance for Duquesne  
8           Light Company (“DLC” or the “Company”).

9   **Q.     Please summarize your responsibilities and duties as they relate to this**  
10          **testimony.**

11  A.     In my capacity as the Director, Operations Work Management & Performance, I  
12          currently have three primary areas of responsibility: (1) operations finance, (2)  
13          operations work management, and (3) operations analytics.

14          The first of these areas, operations finance, involves leading the development of a  
15          five-year plan for the Operations Department’s expense and capital expenditures  
16          as part of the Company’s annual business planning process. Additionally, this  
17          group tracks the Operations Department’s financial performance versus its  
18          budgeted targets through a given year and provides the department with other  
19          financial support.

20  
21          The second of these areas, operations work management, involves administering  
22          the work of the Operations Department’s field resources to ensure that the work  
23          being undertaken aligns with what was included in the five-year plan for the

1 department's expense and capital expenditures. This administration includes the  
2 facilitation of decisions between the insourcing and outsourcing of work,  
3 depending on the capacity of the Company's field workers to take on new work at  
4 any given point in time. The administration of work also includes the scheduling  
5 of work for Company field workers and the provision of asset accounting support,  
6 work order management, and other clerical duties to the Company's field  
7 management.

8  
9 The third and final of these areas, operations analytics, involves the development,  
10 tracking, reporting, and analysis of key performance indicators for the Operations  
11 Department. The operations analytics function enables Company management to  
12 make data-driven decisions with respect to its operations. Additionally, the  
13 operations analytics function performs ad hoc quantitative analyses in support of  
14 the same goal of operational excellence.

15  
16 I am providing this testimony on behalf of the Company primarily due to my  
17 oversight of the development of the five-year plan for the Operations  
18 Department's expense and capital expenditures, discussed above in the context of  
19 the operations finance function. This five-year plan underpins the operational  
20 expenditures for which the Company is seeking recovery through this proceeding.

1 **Q. Please provide your educational background and describe your professional**  
2 **experience.**

3 **A.** As stated, above, I currently am the Director, Operations Work Management &  
4 Performance at DLC. Prior to this role, I served as the Senior Manager, Strategic  
5 Planning & Operational Analytics from November 2015 through February 2017  
6 and the Manager, Operational Analytics from December 2014 through November  
7 2015.

8  
9 Prior to joining DLC, I was a Vice President in the Regulated Utilities group of  
10 Macquarie Infrastructure and Real Assets, Inc. (“MIRA”), where I helped to  
11 identify new private equity investment opportunities and to manage existing  
12 private equity investments in the regulated utility industry. Specific private equity  
13 investments in the regulated utility industry that I helped to manage for MIRA  
14 included investments in DLC; in Aquarion Company, a water utility serving  
15 approximately 220,000 customers in Connecticut, Massachusetts, and New  
16 Hampshire; and in Hawaii Gas, a gas utility serving approximately 68,000  
17 customers in Hawaii.

18  
19 Prior to joining MIRA, I was an Associate in the Oil & Gas investment banking  
20 group of Macquarie Capital (USA) Inc., where I worked with clients in the  
21 upstream, midstream, downstream, and equipment/services sectors of the oil and  
22 gas industry. Specifically, I helped to provide strategic advice related to mergers

1 and acquisitions, restructurings, and recapitalizations and to raise capital in the  
2 private and public equity and debt capital markets.

3  
4 With respect to my educational background, I hold Bachelor of Arts degrees from  
5 Middlebury College and from Columbia University. I additionally hold a Master  
6 of Arts degree from Middlebury College, a Master of Finance degree from  
7 INSEAD, and a Master of Business Administration degree from Columbia  
8 University.

9 **Q. What is the purpose of your direct testimony?**

10 A. The purpose of my testimony is to describe and explain DLC's plant assets to be  
11 placed in service in each the Historical Test Year ("HTY"), the Future Test Year  
12 ("FTY"), and the fully projected future test year ("FPFTY"). Within this  
13 testimony, 2017, 2018, and 2019 represent DLC's HTY, FTY, and FPFTY,  
14 respectively. Specifically, my testimony is intended to: (1) provide a brief  
15 description of DLC's electric delivery system and historical reliability  
16 performance; (2) explain DLC's planning process to ensure its electric system  
17 continues to meet the needs of its customers; (3) describe major plant additions in  
18 2017, 2018, and 2019; and (4) discuss the Company's consolidated tax savings  
19 adjustment in the context of reliability- or infrastructure-related plant additions.

20 **II. DLC'S ELECTRICAL SYSTEM**

21 **Q. Please briefly describe DLC's electric system.**

22 A. DLC provides electric service to approximately 596,000 customers located  
23 primarily in Allegheny and Beaver counties (including the city of Pittsburgh), a

1 service territory of approximately 817 square miles. DLC delivers electricity  
2 from a variety of generation sources through a transmission and distribution  
3 system at the voltage and in the quantity required by our customers. The system  
4 includes approximately 7,039 miles of distribution lines, approximately 686 miles  
5 of transmission lines, 173 company-owned substations, 189 customer-owned  
6 substations, approximately 216,000 utility poles, and 52,480 distribution  
7 transformers. The 52,480 distribution transformers can be broken down further as  
8 36,377 overhead transformers, 10,619 Underground Residential Distribution  
9 (“URD”) transformers, 4,486 pad-mount transformers, 603 network transformers,  
10 and 395 base-mount transformers.

11  
12 The transmission system consists of a network of 345 kV, 138 kV, and 69 kV  
13 transmission lines that supply a series of substations. These lines move bulk  
14 power from various sources of supply, which are not owned by DLC, to the places  
15 in DLC’s service territory where it is needed. These lines are the most reliable  
16 form of power delivery and are the most electrically efficient. They enable the  
17 movement of large quantities of bulk power with minimal energy loss or voltage  
18 drop. These transmission lines supply power to various types of substations  
19 within our service territory. Substation transformers then convert the  
20 transmission voltages to lower (distribution) voltages that are used for distribution  
21 to DLC’s customers.

22

1 Once converted down to distribution voltages (typically 23 kV or 4 kV, except in  
2 our downtown Pittsburgh network system where there is both 11 kV and 23 kV  
3 primary distribution voltage), electricity is delivered to customers through the  
4 local distribution system. The local distribution system consists of distribution  
5 lines, transformers, switches, breakers, and other electrical equipment that DLC  
6 uses to deliver power from the various substations to the customer.

7 **Q. Has DLC been able to maintain reliable service since its last base rate  
8 proceeding?**

9 A. Yes. DLC has maintained high levels of service and reliability. The Company  
10 measures its reliability performance based on three system and customer  
11 reliability metrics: SAIDI, SAIFI, and CAIDI. DLC consistently has performed  
12 well against the standards set by the Commission. For 2017, the Company's  
13 SAIDI, SAIFI, and CAIDI performance was 112, 0.97, and 115, respectively.  
14 The Company's 2017 performance was below (i.e. favorable to) the Benchmark  
15 values for SAIDI and SAIFI, but the Company's 2017 for CAIDI was above (i.e.  
16 unfavorable to) the Benchmark value as detailed in the chart below:

	<b>SAIDI</b>	<b>SAIFI</b>	<b>CAIDI</b>
<b>2017</b>	112	0.97	115
<b>Benchmark</b>	126	1.17	108
<b>Standard</b>	182	1.40	130

17  
18 The Company attributes its CAIDI results in 2017 to increased storm activity  
19 during the year. The Company experienced a total of 26 Storm Days in 2017.  
20 The Company had six PUC Reportable Storms in 2017, which occurred in the  
21 months of February, March, May, June, August, and November. The Company  
22 had no Major Event Exclusions in 2017. In light of this higher storm activity, the

1 Company's 2017 reliability performance was significantly impacted by the  
2 contribution of storm days. This fact is illustrated in the following table.

	<b>Incidents</b>	<b>SAIDI</b>	<b>SAIFI</b>	<b>CAIDI</b>
<b>Blue Sky Days</b>	2,162	56	0.66	85
<b>Storm Days</b>	1,093	56	0.32	175
<b>All Days</b>	3,255	112	0.97	115
<b>Benchmark</b>	-	126	1.17	108
<b>Standard</b>	-	182	1.40	130

3  
4 The Company's 2017 reliability performance on Blue Sky days is seen to have  
5 been significantly below (i.e. favorable to) the Benchmark and Standard values.

6  
7 Duquesne Light must continue to invest in its distribution system to maintain and  
8 enhance the reliability and resilience of its distribution system.

9 **Q. What steps is the Company taking to further improve its service reliability  
10 and reduce outages?**

11 A. As discussed later in my testimony, as well as the testimony of Mr. Karcher  
12 (Statement No. 5 related to the electrical model and net metering), the Company  
13 intends to continue to commit financial resources to improve the efficiency,  
14 training, and equipping of our field employees and to drive the ongoing technical  
15 improvement of our electrical grid that historically has driven our superior  
16 reliability performance. Looking to the future, the Company expects to improve  
17 its service reliability further and reduce outages through more of the same  
18 prudent, innovative investments in our people and our electrical grid that have  
19 benefited our customers in the past.

1 **III. DLC'S PLANNING PROCESS**

2 **Q. Does DLC have a planning process to ensure its electric system continues to**  
3 **meet the needs of its customers?**

4 A. Yes. DLC's planning process encompasses a review of plant additions needed for  
5 transmission and distribution ("T&D") service restoration, T&D customer  
6 commitments, T&D service capacity and reliability, T&D support, and  
7 Information Technology ("IT") projects and programs. This planning process  
8 addresses both our annual investment needs for plant additions and replacements  
9 as well as necessary investments in our energy delivery and support infrastructure  
10 to replace physical infrastructure that is either nearing obsolescence or unable to  
11 meet our customers' needs for capacity or reliability.

12 **IV. PLANT ADDITIONS**

13 **Q. Can you summarize the process used by DLC to determine which plant**  
14 **additions are necessary and when they must be added?**

15 A. Yes. DLC identifies the need and priority for plant additions by comparing  
16 knowledge regarding the condition and use of its assets to knowledge regarding  
17 the future performance requirements of those assets. In cases in which a problem  
18 with future performance is predicted or in which a need to improve performance  
19 has been identified, DLC engineers develop a variety of reasonable alternatives to  
20 resolve the problem or meet the need. Each alternative is then evaluated on its  
21 technical and financial merits and the alternative with the greatest customer value  
22 consistent with DLC's service and cost-effectiveness objectives is recommended.

23



1 A Company management team reviews these recommended plant additions and  
2 challenges the underlying technical and financial facts, assumptions, and  
3 conclusions. This process ensures that appropriate analytical rigor is applied to  
4 the decision-making process and ensures that each plant addition is considered  
5 within the context of all other plant needs. This is an iterative process that  
6 continues until a final decision is made on a plant addition.

7  
8 Approved plant additions are then included in an integrated work plan that is used  
9 by DLC planners, engineers, schedulers, and project managers to ensure optimum  
10 sequencing of the many different additions made during any given year. As  
11 projects are completed, field supervisors perform project reviews to assure the  
12 scope of work has been completed and then notify the plant accounting  
13 department to ensure proper accounting treatment of the project.

14 **Q. Please explain the reasons why DLC makes plant additions.**

15 A. DLC makes plant additions in order to provide safe and reliable service to our  
16 customers. Plant additions, including those planned through the end of the  
17 FPPTY, are necessary for five primary reasons and are categorized accordingly  
18 as: (1) T&D Service Restoration, (2) T&D Customer Commitments, (3) T&D  
19 Service Capacity and Reliability, (4) T&D Support, and (5) IT Projects and  
20 Programs. DLC's plans for total plant additions in 2017, 2018, and 2019 include  
21 placing approximately \$799.9 million of plant assets in service.

22

1 Of this \$799.9 million of plant assets being placed in service, this includes \$89.4  
2 million of intangible plant, \$95.8 million of transmission plant, \$448.8 million of  
3 distribution plant, \$92.6 million of general plant, and \$73.2 million of Advanced  
4 Metering Infrastructure (“AMI”) plant. Ultimately, this \$799.9 million of plant  
5 additions is included in DLC’s total utility plant in service. Please reference the  
6 Direct Testimony of Howard S. Gorman for more information on the  
7 jurisdictional separation of DLC’s total utility plant in service.

8  
9 The value of plant assets to be placed in service in 2017, 2018, and 2019 is  
10 summarized by category and by FERC Account in Exhibits BBM-1 and BBM-2,  
11 respectively.

#### 12 T&D SERVICE RESTORATION

13 **Q. Please explain T&D Service Restoration as a primary reason for making**  
14 **capital additions.**

15 A. DLC customers expect their electric service to be restored promptly if it is  
16 interrupted. Service Restoration includes plant additions to replace equipment  
17 that has failed in service and either resulted in a service interruption to DLC  
18 customers or presented a significant risk of an imminent service interruption by  
19 virtue of the equipment’s physical condition. Plant additions in this category  
20 include additions to replace equipment failures related to storms, adverse weather  
21 conditions, animal contacts, and equipment that fails due to reaching the end of its  
22 service life. This category also includes plant additions in response to outages  
23 caused by customers and/or their equipment, including motor vehicle accidents.

1 Forecasts of plant additions needed for Service Restoration are estimated based on  
2 previous years' experience.

3 **Q. Please summarize the types of plant additions that are included in the 2017,**  
4 **2018, and 2019 values for T&D Service Restoration.**

5 A. T&D Service Restoration includes both overhead and underground facilities that  
6 require replacement as a result of storms or equipment failures. Specific T&D  
7 Service Restoration plant additions may include the replacement of poles, conduit,  
8 wire and cable, transformers, switches, capacitors, voltage regulators, and any  
9 associated supporting equipment for distribution class voltages. From 2017  
10 through 2019, DLC projects to place \$96.8 million of plant assets in service in the  
11 T&D Service Restoration category.

#### 12 **T&D CUSTOMER COMMITMENTS**

13 **Q. Please explain T&D Customer Commitments as a primary reason for**  
14 **making capital additions.**

15 A. DLC serves residential, commercial and industrial customers. All customer  
16 classes rely on us to provide service for new or remodeled homes and businesses,  
17 and also to upgrade existing services to meet new capacity requirements they may  
18 have as a result of additional load such as computers and air conditioning. T&D  
19 Customer Commitments also include plant additions associated with relocations  
20 of Company facilities that are regularly requested by governmental agencies due  
21 to highway improvements or other rights-of-way interferences. These projects  
22 include road widening, bridge repairs, sewer and water main  
23 replacements/upgrades, or other infrastructure improvements.

1

2 Forecasts of plant additions needed as a result of T&D Customer Commitments  
3 are based upon forecasted economic conditions in the DLC service area, projected  
4 number of new customers, known major customer projects, and known projects  
5 identified by state, county, city and local municipalities.

6 **Q. Please summarize the types of plant additions that are included in the 2017,  
7 2018, and 2019 values for T&D Customer Commitments.**

8 A. From 2017 through 2019, DLC's projections include placing \$58.5 million of  
9 plant assets in service for T&D Customer Commitments. This amount funds  
10 hundreds of various sized projects to install overhead or underground distribution  
11 equipment requested by residential, commercial or industrial customers, or  
12 governmental agencies in accordance with DLC's tariff, equipment standards, and  
13 construction standards, which reflect the National Electrical Safety Code  
14 ("NESC").

15 **T&D SERVICE CAPACITY AND RELIABILITY**

16 **Q. Please explain T&D Service Capacity and Reliability as a primary reason for  
17 making plant additions.**

18 A. DLC customers expect our electric system to possess sufficient equipment  
19 capacity to ensure reliability and voltage-stability. Plant additions to the DLC  
20 electric system are required to ensure that it continues to meet those needs as  
21 customer load grows or the location of load shifts within the DLC service  
22 territory. The types of additions required to ensure service capacity and reliability  
23 include substation upgrades, circuit extensions and conversions to ensure the

1 distribution system meets our customers' voltage and load requirements, and the  
2 installation of new equipment to replace deteriorated, obsolete, or failed  
3 equipment.

4  
5 Forecasts of plant additions needed to ensure T&D Service Capacity and  
6 Reliability are identified through analysis of inspection and maintenance program  
7 results, reliability data analysis, reviews of customer requests, and an engineering  
8 review of load growth in particular areas.

9 **Q. Please summarize the types of plant additions that are included in the 2017,**  
10 **2018, and 2019 values for T&D Service Capacity and Reliability.**

11 A. In the time period of 2017, 2018, and 2019, DLC's projections include placing in  
12 service \$341.7 million in plant assets for T&D Service Capacity and Reliability.  
13 The T&D Service Capacity and Reliability forecasted plant additions of \$341.7  
14 million includes \$197.4 million of projects and programs to address emergent  
15 issues and to systematically replace equipment that is at the end of its useful life  
16 due to operational inefficiency or obsolescence. The remaining \$144.4 is related  
17 to projects and programs approved as a part of the Company's Long Term  
18 Infrastructure Improvement Plan ("LTIIIP").

19 **Q. Please describe the Company's major Non-LTIIP T&D Service Capacity and**  
20 **Reliability projects and programs that are expected to be in service by**  
21 **December 2019.**

22 A. There are two major Non-LTIIP capital programs and one Non-LTIIP project  
23 included in the T&D Service Capacity and Reliability category. The programs

1 include the “Pole Assessment, Repair and Replacement Program,” and the  
2 “Overhead Line Rehabilitation Program.” Additionally, the Montour Substation  
3 Project is included in T&D Service Capacity and Reliability category.

4 **Q. Please describe the Pole Assessment, Repair, and Replacement Program.**

5 A. This program includes the replacement and repair of poles and any associated  
6 supporting equipment for distribution class voltages. Transmission poles that fail  
7 inspection are replaced under a separate program. As required by Duquesne  
8 Light’s Inspection and Maintenance (“I&M”)<sup>1</sup> plan, the Company inspects  
9 distribution poles on a 12 year cycle. The I&M plan also provides for the  
10 replacement of poles as necessary and appropriate based on the condition of the  
11 pole. Specifically, the I&M plan states

12 *“If a pole fails the ground line inspection and shows dangerous conditions*  
13 *that are an immediate risk to public or employee safety or conditions*  
14 *affecting the integrity of the circuit, the pole shall be replaced within 30*  
15 *days of the date of inspection”*

16 The Company projects placing \$29.0 million of plant assets in service in the  
17 period from 2017 through 2019 as a result of this program.

18 **Q. Please describe the Overhead Line Rehabilitation Program.**

19 A. The main purpose for the overhead distribution plant and all of its components is  
20 to provide reliable, quality electric service to all DLC customers in a way that  
21 ensures the safety of the customers, the distribution equipment, and the general  
22 public. DLC continually monitors and reviews the operation of its overhead

---

<sup>1</sup> Duquesne Light files its Inspection and Maintenance plan with the PUC as required by 52.  
Pa.Code. §57.195.

1 distribution plant and prioritizes activities, including repair and replacement, as  
2 required to maintain SAIFI, SAIDI and CAIDI reliability targets and high  
3 customer satisfaction. This program addresses the replacement of poles, wire,  
4 transformers, switches, capacitors, voltage regulators, and any associated  
5 supporting equipment for distribution class voltages. Failure of this equipment  
6 could result in service interruptions and property or equipment damage. It is  
7 necessary to maintain the overhead distribution and subtransmission systems in  
8 proper working order to assure reliability and public safety.

9 The Company projects placing \$10.6 million of plant assets in service in the  
10 period from 2017 through 2019 as a result of this project.

11 **Q. Please describe the major Non-LTIIP capital project included in the T&D**  
12 **Service Capacity and Reliability category.**

13 A. Duquesne Light plans to rebuild the Montour Substation located near Coraopolis  
14 Borough. The substation is being rebuilt because the existing facilities are  
15 significantly aged and at the end of their expected useful life. Montour  
16 Substation will be updated to include a new 138 kV breaker and a half bus  
17 scheme, associated structures, new breakers, disconnects, relays, control cables  
18 and other associated facilities. New relay and control panels will be installed in  
19 the new control house for the 138 kV breakers. Montour Substation will also  
20 require a new 138/23 kV Control House, yard expansion, laydown area,  
21 enhancements to the entrance road, installation of new ground grid, environmental  
22 controls, and transformer containment pits. The yard expansion will also require

1 an upgrade to the security of the station to meet CIP requirements. The 23 kV  
2 protection and controls will be consolidated into the new Control House.

3

4 The Company projects placing approximately \$9.7 million of plant assets in  
5 service in the period from 2017 through 2019 as a result of this project.

6 **Q. You mentioned that the T&D Service Capacity and Reliability category**  
7 **included \$144.4 million in LTIP projects and programs. Please explain.**

8 A. On April 15, 2016, Duquesne Light filed a Petition for Approval of its LTIP  
9 (“LTIP Petition”) at docket number P-2016-2540046. In the LTIP Petition,  
10 Duquesne Light requested that the Commission approve its proposal for  
11 accelerating the repair, improvement and replacement of aging infrastructure for  
12 the six-year period beginning January 1, 2017. The Company’s LTIP was  
13 approved on September 15, 2016.

14

15 A copy of the DLC’s Commission-approved LTIP is available at  
16 [www.puc.state.pa.us/pcdocs/1432449.pdf](http://www.puc.state.pa.us/pcdocs/1432449.pdf).

17

18 On May 26, 2016, DLC filed a petition seeking approval of a Distribution System  
19 Improvement Charge (“DSIC”). By Order entered April 20, 2017, the  
20 Commission approved DLC’s DSIC at docket number P-2016-2540046. The  
21 Company recovers costs associated with its LTIP through its DSIC. As  
22 explained in the testimony of Mr. Davis (Statement No. 1), the Company is  
23 proposing to roll the DSIC into base rates.



1 **T&D SUPPORT**

2 **Q. Please explain “T&D Support” as a primary reason for making plant**  
3 **additions.**

4 A. Providing safe and reliable distribution service to customers requires more than an  
5 electric distribution system. It requires assets to support the workforce who  
6 operate and maintain that system and provide other services to our customers.  
7 T&D Support plant additions include both projects and programs related to items  
8 such as metering infrastructure, new vehicle purchases needed to replenish our  
9 fleet, and upgrades to existing Company facilities, amongst other needs.

10

11 Forecasts of plant additions for T&D Support projects are typically generated  
12 based upon the specifics of the projects’ scopes of work, which dictate  
13 individualized amounts of labor, materials, outside services, and other related  
14 expenditures. In contrast, forecasts of plant additions for T&D Support programs  
15 typically are based on past experience for items such as meter replacements and  
16 facility upgrades, and on analysis of needs for items such as new facilities and  
17 vehicle replacements.

18 **Q. Please summarize the types of plant additions that are included in the 2017,**  
19 **2018, and 2019 projections for “T&D Support”.**

20 A. From 2017 through 2019, DLC will invest \$79.8 million in plant assets for T&D  
21 Support projects including vehicles, communications, information technology,  
22 metering, facility improvements, and other routine requirements related to

1 providing distribution service. Of the \$79.8 million, the T&D Support category  
2 includes:

- 3 • \$19.7 million for meters and associated equipment unrelated to the  
4 Company's initial smart meter deployment;
- 5 • \$18.4 million for fleet management which include the repair and/or  
6 replacement of the Company's approximate 900 transportation related  
7 assets;
- 8 • \$16.2 million for the facilities management program which provides a  
9 comprehensive plan to ensure the proper management of the Companies  
10 facilities, including meeting our NERC mandatory CIP Reliability  
11 Standards that address the security of our cyber assets.

12 These traditional plant investments total \$54.4 million of the \$79.8 million  
13 projected to be in service by December 2019. Additionally, the T&D Support  
14 category includes \$16.1 million associated with smaller projects and program not  
15 reviewed in detail within my testimony.

16 **Q. Is the Company proposing any additional T&D Support projects?**

17 A. Yes. The Company is proposing to develop a natural gas-fueled Microgrid at its  
18 Woods Run campus. The primary need for the Woods Run Microgrid project is  
19 to increase the electrical resilience of the greater Pittsburgh region. This will be  
20 accomplished by strengthening the electrical resilience of the Company's Woods  
21 Run campus and Preble Avenue Service Center, which are critical infrastructure  
22 assets that are necessary for the safe and reliable functioning of the region's  
23 electrical grid. Specifically, the Woods Run Microgrid is intended to protect the

1 Woods Run campus and Preble Avenue Service Center in the event of a  
2 prolonged, regional grid-failure caused by a “black sky” event (i.e. a natural or  
3 man-made disaster).

4  
5 DLC selected the Woods Run campus and Preble Avenue Service Center facilities  
6 for the Company’s proposed microgrid project primarily for two reasons. First,  
7 the facilities comprise the Company’s most important operations facilities, which  
8 would be used to restore power to the greater Pittsburgh region in the event of a  
9 prolonged, regional grid-failure caused by a “black sky” event. As such, DLC  
10 regards its Woods Run campus and Preble Avenue Service Center as a critical  
11 infrastructure assets for the region. Second, the campus-style proximity of seven  
12 buildings constituting the Woods Run campus and Preble Avenue Service Center  
13 lend themselves well to a cost-effective microgrid design.

14 **Q. Where is the Woods Run campus located?**

15 A. DLC’s Woods Run campus and Preble Avenue Service Center both are located on  
16 Beaver Avenue in the City of Pittsburgh’s Marshall-Shadeland neighborhood,  
17 which is situated in the City’s North Shore district. DLC’s Woods Run campus,  
18 including the neighboring Preble Avenue Service Center, serves as the  
19 Company’s largest operations facility and the one responsible for ensuring the  
20 ongoing, reliable functioning of downtown Pittsburgh’s electrical transmission  
21 and distribution infrastructure. In the event of any service-interruption in  
22 downtown Pittsburgh, it is the employees from the Woods Run campus and  
23 Preble Avenue Service Center who are responsible for restoring power to the

1 areas residential, commercial, industrial, institutional, and governmental  
 2 customers. For this reason, the Woods Run campus and Preble Avenue Service  
 3 Center facilities are critical community infrastructure asset for the greater  
 4 Pittsburgh region.

5  
 6 **Q. Does the Woods Run campus currently have back-up generation?**

7 A. The Woods Run campus does not have sufficient emergency back-up generation  
 8 to fuel the entire campus including the Preble Avenue Service Center. Currently,  
 9 DLC’s Woods Run campus and Preble Avenue Service Center have three diesel-  
 10 fueled emergency back-up generators located on-site, attached to separate, non-  
 11 electrically-interconnected buildings. Specifically, Woods Run Building #2  
 12 possesses a 750 kW diesel-fueled emergency back-up generator, Woods Run  
 13 Building #3 possesses a 750 kW diesel-fueled emergency back-up generator that  
 14 serves one sector of the building, and Preble Avenue Service Center possesses a  
 15 200 kW diesel-fueled emergency back-up generator.

Building	Generator Capacity	Fuel-Type
Woods Run Building #2	750 kW	Diesel
Woods Run Building #3	750 kW	Diesel
Preble Avenue Service Center	200 kW	Diesel

16  
 17  
 18  
 19  
 20  
 21 As a result of this project’s new natural gas generators, DLC is considering  
 22 relocating the diesel generators currently located at Woods Run #3 and Preble

1 Avenue Service Center to support Company facilities at other locations in need of  
2 emergency back-up power supplies.

3 **Q. Given that DLC already has back-up generation at the Woods Run campus,**  
4 **why is this project reasonable and prudent?**

5 A. DLC’s Woods Run campus and Preble Avenue Service Center currently possess  
6 prudent measures to protect the buildings from individual circuit interruptions,  
7 with these measures taking the form of redundant circuit-feeds or diesel-fueled  
8 emergency back-up generators. Given the Company’s obligation to provide an  
9 essential service to the public, failure to have any back up generation for  
10 emergency situations arguably would be imprudent.

11

12 The main intent of the Woods Run Microgrid project, however, is to protect  
13 DLC’s critical operations facilities from a “black sky” event—a prolonged or  
14 regional total grid-outage of which individual circuit-interruptions are not the root  
15 cause. In the case of such a “black sky” event and regional failure of the electric  
16 grid, the diversity of electric distribution circuits feeding the Woods Run campus  
17 and Preble Avenue Service Center will not protect DLC’s operations facilities.

18 Similarly, while the Company’s three existing diesel-fueled emergency back-up  
19 generators are helpful, not all of the buildings on the Woods Run campus possess  
20 such generators, and they depend upon a single fuel-source (i.e. diesel) whose  
21 supply-chain could be disrupted. As a result, DLC believes that it would be  
22 prudent to add centralized natural gas generators to serve as back up for all of the

1 facilities and rely upon these diesel-fueled emergency back-up generators as a  
2 true last resort to power the Company's operations facilities.

3 **Q. How would a prolonged outage at the Woods Run campus impact the**  
4 **Company's ability to provide essential electric distribution services to the**  
5 **public?**

6 A. If the power supply at the Woods Run campus and Preble Avenue Service Center  
7 were interrupted as part of a prolonged, regional grid-failure caused by a "black  
8 sky" event and the three existing emergency back-up generators located on-site  
9 exhausted their supply of diesel fuel, then the operational impact on DLC's  
10 operations would be severe. Without having the Woods Run campus and Preble  
11 Avenue Service Center in-power during such an outage, the Company would not  
12 be able to accomplish the following list of items necessary to restore power to the  
13 greater Pittsburgh region:

- 14 • Operating DLC's electric transmission and distribution grid from the  
15 Company's primary operations campus to facilitate a region-wide restoration  
16 of power;
- 17 • Providing the Company's engineers and other critical staff with work-places  
18 to facilitate the repair of the electrical transmission and distribution grid;
- 19 • Enabling the operation of overhead line-worker crews, underground line-  
20 worker crews, trouble-shooters, and substation crews out of their service  
21 center garages located at Woods Run and Preble Avenue Service Center;
- 22 • Providing visiting, out-of-territory mutual assistance line-worker crews with a  
23 place to muster at Woods Run to help with grid repairs;

- 1           • Repairing and maintaining DLC’s vehicles, as well as those of visiting mutual  
2           assistance crews, that are necessary for making grid-repairs at the Company’s  
3           primary transportation services facility at Woods Run; and
- 4           • Providing DLC’s executive leadership and management team members with  
5           facilities at which to direct and coordinate the restoration work.

6

7           The Woods Run Microgrid ultimately is intended to provide DLC with the  
8           electrical resilience needed to enable these activities in the event of a prolonged,  
9           regional grid-failure, facilitating the restoration of power to the greater Pittsburgh  
10          region as safely and quickly as possible. In addition, as explained below, the  
11          microgrid also can provide reliability benefits and be used as an opportunity to  
12          learn how such systems interact with the distribution grid in a controlled  
13          environment.

14   **Q.    Does the Company anticipate reliability benefits from having a Microgrid at**  
15   **its Woods Run campus?**

16   A.    Absolutely. If we think about electrical reliability in terms of the frequency of  
17   outages (as measured by SAIFI) versus the duration of outages (as measured by  
18   SAIDI and CAIDI), it is the duration of outages that will be more meaningful in  
19   the scenario of a prolonged, regional grid-failure. Similarly, it is the duration of  
20   outages, as opposed to the frequency, on which DLC’s Woods Run campus and  
21   Preble Avenue Service Center have the most impact, because it is at these  
22   locations that the personnel and equipment for responding to outages in the  
23   greater Pittsburgh region are located.

1 **Q. What are the components of the Microgrid?**

2 **A.** In the simplest of formats, the new components of the proposed Woods Run  
3 Microgrid project can be summarized in two categories:

- 4 • Distributed Energy Resource (“DER”) assets that generate electricity to be  
5 consumed by the buildings interconnected to the microgrid.
- 6 • A microgrid controller to balance the electricity produced by the DER assets  
7 interconnected to the microgrid with the electricity consumed by each of the  
8 seven buildings interconnected to the microgrid.

9 DER assets are an integral part of a microgrid because it is necessary to render the  
10 microgrid operational as a self-sustaining electrical island by providing electricity  
11 that is consumed by the facilities interconnected to the microgrid. DER assets  
12 will be sited at the Company’s Woods Run campus to support the microgrid. The  
13 DER assets proposed for this purpose to consist of two natural gas-fueled  
14 reciprocating internal combustion engines, two battery energy storage banks, and  
15 three small vertical-axis wind turbines.

16 **Q. Why is DLC proposing to add natural gas-fueled emergency back-up  
17 generators to the Microgrid?**

18 **A.** The rationale behind the decision to propose utilizing natural gas-fueled  
19 emergency back-up generators in the design of the Woods Run Microgrid project  
20 is based upon a fundamental tenet of sustainability: diversity promotes resilience.  
21 Borrowing from the field of ecology for the sake of analogy, diversity affects an  
22 ecosystem’s ability to resist disturbance, and different types of disturbances  
23 impact organisms in different ways. For instance, some organisms may thrive in



1       disturbed environments in which other organisms cannot survive. As a result,  
2       diverse ecosystems ultimately are more resilient than less diverse ecosystems,  
3       possessing a higher probability of recovery after a disturbance. Applying this  
4       analogy to a microgrid, which can be thought of as an electrical ecosystem, it  
5       follows that a microgrid possessing a greater diversity of fuel-sources for its DER  
6       assets is fundamentally more resilient than a microgrid dependent upon a single  
7       fuel-source for its DER assets.

8

9       In the specific instance of the Woods Run Microgrid project, consider the  
10       resilience-benefit offered by the proposed addition of natural gas-fueled  
11       emergency back-up generators to supplement the three existing diesel-fueled  
12       emergency back-up generators currently on-site at the Woods Run campus and  
13       Preble Avenue Service Center. Diesel-fueled generators, as a general rule, tend to  
14       be fueled by diesel stored on-site, and conventional wisdom dictates that, in the  
15       face of re-fueling uncertainty, generators consuming on-site diesel should be run  
16       as a last resort. Ahead of diesel-fueled generators, with their on-site fuel-storage,  
17       it is preferable to operate natural gas-fueled generators, if available, because they  
18       draw their fuel from the natural gas transmission and distribution system, as long  
19       as it is functional, thereby preserving on-site diesel fuel supplies. Thus, by  
20       creating the optionality of operating emergency back-up generators fueled by  
21       either diesel or natural gas, DLC would increase the electrical resilience of its  
22       Woods Run campus and Preble Avenue Service Center by providing a diversity of  
23       fuel-sources to increase the probability of “survival” in the event that one of the

1 two fuel supply-chains is interrupted in a “black sky” scenario. Since DLC  
2 already possesses diesel-fueled emergency back-up generators, it is prudent for  
3 the Company to include natural gas-fueled emergency back-up generators in the  
4 design of the Woods Run Microgrid project.

5 **Q. How often does DLC intend to utilize the back-up generation?**

6 A. It is not DLC’s intent to operate the centralized natural gas-fueled generators to  
7 provide daily service to customers. Rather, the centralized natural gas-fueled  
8 generators would be intended for emergency scenarios (e.g. power-outages or  
9 load-reductions) and the generators’ output currently is anticipated to be for the  
10 sole consumption of the Company. In this manner, the proposed centralized  
11 natural gas-fueled generators would be operated in a similar fashion to the  
12 Company’s three existing, de-centralized diesel-fueled emergency back-up  
13 generators located at the Woods Run campus and Preble Avenue Service Center.

14 **Q. Is DLC proposing to integrate renewable energy sources into the Microgrid?**

15 A. As mentioned above, DLC is planning to add a small amount of renewable DER  
16 assets to the Woods Run Microgrid in the form of three vertical-axis wind-  
17 turbines. Such behind-the-meter, renewable DER assets would provide additional  
18 fuel-diversity to the totality of the DER assets located at the Woods Run campus  
19 and Preble Avenue Service Center, thereby increasing the facilities’ electrical  
20 resilience.

1 **Q. You mentioned that the Microgrid will include a controller. How and why is**  
2 **a controller required for the Microgrid?**

3 A. The function of the microgrid controller is to enable the balancing of the  
4 electricity produced by the DER assets interconnected to the microgrid, such as  
5 the centralized natural gas-fueled emergency back-up generation, with the  
6 electricity consumed by each of the seven buildings interconnected to the  
7 microgrid. This balancing is achieved primarily by the microgrid controller  
8 modulating the electrical output from the DER assets to match the electrical  
9 consumption of the buildings at any given point in time.

10 **Q. How will the Company operate the Microgrid?**

11 A. DLC intends to operate the Woods Run Microgrid primarily in “grid-connected”  
12 mode, meaning that the seven buildings attached to the microgrid would be  
13 supplied by electricity drawn from the broader distribution grid. Under  
14 emergency or other appropriate circumstances, such as during a prolonged,  
15 regional grid-outage or if the broader distribution grid were at risk of being  
16 electrically overloaded, DLC would propose to isolate, or “island,” the seven  
17 facilities located at the Woods Run campus and Preble Avenue Service Center  
18 from the broader distribution grid and activate the microgrid’s emergency back-up  
19 generators until such time as the emergency condition is resolved.

20 **Q. You have detailed the resilience and reliability benefits of the Microgrid.**  
21 **Are there other benefits of the Woods Run Microgrid project?**

22 A. A secondary benefit of the proposed Woods Run Microgrid project is that it will  
23 permit the employees of DLC, as well as the students and faculty of the

1 Company's academic partner on the project, the University of Pittsburgh, to  
2 increase their respective practical knowledge about microgrid operations in a  
3 familiar, controlled environment in the face of increasing interest in microgrid  
4 technology from DLC's customers for resilience purposes.

5 **Q. What is the value of the Woods Run Microgrid project's plant additions?**

6 A. The value of the Woods Run Microgrid's plant additions is \$9.3 million, which  
7 will be placed in service by December 2019.

8 **IT PROJECTS AND PROGRAMS**

9 **Q. Please explain IT Projects and Programs as a primary reason for making**  
10 **plant additions.**

11 A. Meeting the critical needs of DLC customers requires IT assets to support the  
12 workforce who operate and maintain that system and provide other services to our  
13 customers. IT Projects plant additions include projects related to such items as  
14 AMI, cyber security, and Supervisory Control and Data Acquisition ("SCADA),  
15 amongst other needs. Forecasts of plant additions for IT Projects typically are  
16 generated based upon the specifics of the projects' respective scopes. IT  
17 Programs plant additions include programs related to such items as corporate  
18 applications, amongst other needs. Forecasts of plant additions for IT Programs  
19 typically are based both on past experience and on analyses of future needs for  
20 items such as hardware and software upgrades and supplements.

1 **Q. Please summarize the types of plant additions that are included in the 2017,**  
2 **2018, and 2019 projections for IT Projects and Programs.**

3 A. In the time period of 2017 through 2019, DLC will invest \$223.2 million in IT  
4 Projects and Program. These program and projects are detailed in the testimony  
5 of Mr. Mark Miko (Statement No.8).

6 **V. CONSOLIDATED TAX SAVINGS ADJUSTMENT (“CTA”)**

7 **Q. In Mr. Simpson’s Exhibit MLS-2, he calculates the CTA adjustment to be**  
8 **\$5.5 million. Has DLC used at least 50 percent of that amount to support**  
9 **reliability or infrastructure related plant additions?**

10 A. Yes. DLC projects placing approximately \$341.7 million of plant assets in  
11 service in the period from 2017 through 2019 related to T&D System Capacity  
12 and Reliability projects, \$144.4 million of which are attributable to LTIP  
13 Initiatives. This leaves \$197.4 million of T&D System Capacity and Reliability  
14 plant assets projected to be placed in service in excess of the Company’s LTIP  
15 plant in the period from 2017 through 2019. This \$197.4 million amount is much  
16 greater than 50% of the \$5.5 million amount that Mr. Simpson identifies as a  
17 consolidated tax savings adjustment.

18 **VI. CONCLUSION**

19 **R. Are the plant additions described in your testimony necessary?**

20 A. Yes, they are. The plant additions described herein are necessary to meet the  
21 needs of DLC’s customers.

1 **Q. Has the Company included any plant additions related to its Smart Meter**  
2 **Plan, LTIP, or Energy Efficiency and Conservation Plan in its rate base**  
3 **claim in this proceeding?**

4 A. As explained in the Direct Testimony of Jamie Davis (Statement No. 1), the  
5 Company is proposing to roll its smart meter- and LTIP-related plant into base  
6 rates at this time and not recover these investments through the smart meter  
7 charge or DSIC. The Company is not including any plant related to its Energy  
8 Efficiency and Conservation Plan in its rate base claims in the proceeding.

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

10 A. Yes, it does.

## Exhibit BBM-1

### Duquesne Light Company

#### January 1, 2017 through December 31, 2019 Projected Plant In-Service Additions (by Category)

(\$)

	2017	2018	2019	2018-2019	2017-2019
	<i>HTY</i>	<i>FTY</i>	<i>FPFTY</i>	<i>TOTAL</i>	<i>TOTAL</i>
<b>TRANSMISSION &amp; DISTRIBUTION</b>					
Service Restoration	\$39,842,392	\$28,525,251	\$28,396,026	\$56,921,277	\$96,763,669
Customer Commitments	20,490,403	18,467,310	19,562,788	38,030,098	58,520,501
LTIP Initiatives	41,271,018	49,109,003	53,981,473	103,090,476	144,361,494
Programs	44,148,196	37,669,253	36,518,503	74,187,756	118,335,953
Projects	9,962,191	37,706,773	31,351,488	69,058,261	79,020,452
System Capacity and Reliability	95,381,406	124,485,029	121,851,464	246,336,493	341,717,899
Support	19,588,571	28,428,496	31,751,774	60,180,271	79,768,841
Sub-Total	\$175,302,771	\$199,906,087	\$201,562,052	\$401,468,139	\$576,770,910
<b>INFORMATION TECHNOLOGY</b>					
Projects and Programs	\$63,942,819	\$83,372,939	\$75,859,223	\$159,232,163	\$223,174,982
<b>TOTAL</b>	<b>\$239,245,591</b>	<b>\$283,279,026</b>	<b>\$277,421,276</b>	<b>\$560,700,301</b>	<b>\$799,945,892</b>

## Exhibit BBM-2

### Duquesne Light Company

#### January 1, 2017 through December 31, 2019 Projected Plant In-Service Additions (by FERC Account)

(\$)

	2017	2018	2019	2018-2019	2017-2019
	<i>HTY</i>	<i>FTY</i>	<i>FPPTY</i>	<i>TOTAL</i>	<i>TOTAL</i>
<b>INTANGIBLE PLANT</b>					
301 - Organization	\$(710)	\$-	\$-	\$-	\$(710)
302 - Franchises and consents	-	-	-	-	-
303 - Miscellaneous intangible plant	21,484,890	31,280,868	36,697,872	67,978,740	89,463,630
Sub-Total	\$21,484,179	\$31,280,868	\$36,697,872	\$67,978,740	\$89,462,920
<b>TRANSMISSION PLANT</b>					
350 - Land and land rights	\$(31,416)	\$-	\$763,391	\$763,391	\$731,975
352 - Structures and improvements	6,103,538	594,634	6,070,603	6,665,237	12,768,775
353 - Station equipment	7,434,079	14,504,428	13,754,374	28,258,802	35,692,881
354 - Towers and fixtures	(2,221,837)	2,096,277	691,158	2,787,436	565,598
355 - Poles and fixtures	72,386	1,538,761	548,719	2,087,481	2,159,866
356 - Overhead conductors, devices	11,192,852	10,652,033	3,835,204	14,487,237	25,680,089
357 - Underground conduit	2,773,415	-	-	-	2,773,415
358 - Underground conductors, devices	1,296,979	-	-	-	1,296,979
359 - Roads and trails	-	-	-	-	-
382 - Trans computer equipment	1,260,127	1,917,072	2,213,612	4,130,684	5,390,811
383 - Trans intangible plant	(170,720)	3,517,072	5,413,612	8,930,684	8,759,964
Sub-Total	\$27,709,403	\$34,820,278	\$33,290,673	\$68,110,951	\$95,820,354



<b>DISTRIBUTION PLANT</b>					
360 - Land and land rights	\$-	\$280,902	\$-	\$280,902	\$280,902
361 - Structures and improvements	972,050	4,039,313	465,216	4,504,529	5,476,579
362 - Station equipment	14,611,530	10,820,390	31,472,921	42,293,312	56,904,842
364 - Poles, towers and fixtures	18,834,179	35,057,525	34,054,272	69,111,796	87,945,975
365 - Overhead conductors, devices	39,070,759	32,136,833	24,679,465	56,816,298	95,887,057
366 - Underground conduit	5,652,088	12,057,355	8,757,874	20,815,228	26,467,316
367 - Underground conductors, devices	29,095,189	13,962,448	14,519,093	28,481,541	57,576,730
368 - Line transformers	18,104,530	31,010,096	31,631,530	62,641,627	80,746,157
369 - Services	2,524,654	5,750,629	5,854,722	11,605,351	14,130,005
370 - Meters	4,585,195	7,826,479	7,776,457	15,602,935	20,188,130
371 - Installs customer premise	-	-	-	-	-
373 - Street lighting, signal system	1,936,683	605,983	617,368	1,223,351	3,160,034
Sub-Total	\$135,386,857	\$153,547,952	\$159,828,917	\$313,376,869	\$448,763,727
<b>GENERAL PLANT</b>					
389 - Land and land rights	\$-	\$-	\$-	\$-	\$-
390 - Structures and improvements	7,379,206	10,816,772	4,845,554	15,662,326	23,041,532
391 - Office furniture, equipment	4,977,928	5,855,544	8,511,706	14,367,250	19,345,178
392 - Transportation equipment	4,494,004	7,000,000	7,000,000	14,000,000	18,494,004
393 - Stores equipment	-	-	-	-	-
394 - Tools, shop, garage equipment	994,998	1,858,083	1,831,130	3,689,213	4,684,211
395 - Laboratory equipment	(1,443)	-	-	-	(1,443)
396 - Power operated equipment	368,446	-	-	-	368,446
397 - Communication equipment	2,902,873	12,879,778	10,905,183	23,784,961	26,687,835
398 - Miscellaneous equipment	-	-	-	-	-
399 - Other tangible property	-	-	-	-	-
Sub-Total	\$21,116,013	\$38,410,178	\$33,093,573	\$71,503,750	\$92,619,764

<b>ADVANCED METERING INFRASTRUCTURE (AMI) SURCHARGE PLANT</b>					
303 - Miscellaneous intangible plant	\$1,813,863	\$8,070,320	\$4,643,277	\$12,713,597	\$14,527,460
370 - Meters	31,046,923	15,636,245	8,996,349	24,632,594	55,679,516
397 - Communication equipment	688,352	1,513,185	870,614	2,383,799	3,072,151
Sub-Total	\$33,549,138	\$25,219,750	\$14,510,240	\$39,729,990	\$73,279,128
<b>TOTAL</b>	<b>\$239,245,591</b>	<b>\$283,279,026</b>	<b>\$277,421,276</b>	<b>\$560,700,301</b>	<b>\$799,945,892</b>

**BEFORE THE  
PENNSYLVANIA PUBLIC UTILITY COMMISSION**

**Docket No. R-2018-3000124**

**Duquesne Light Company**

**Statement No. 5**

**DIRECT TESTIMONY OF JAMES KARCHER  
SUBJECT: DISTRIBUTION SYSTEM MODELING AND MANAGEMENT**

**Date: March 28, 2018**

1 **I. INTRODUCTION**

2 **Q. Please state your full name and business address.**

3 A. My name is James T. Karcher. My business address is 2839 New Beaver Avenue, Mail  
4 Drop N2-SO, Pittsburgh, PA 15233.

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

6 A. I am employed by Duquesne Light Company (“Duquesne Light” or “Company”) as  
7 Manager, Operations Technology Projects.

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

9 A. I graduated from Penn State University in 1985 with a BS Electrical Engineering. I have  
10 31 years of experience in the Electric Utility Business including: Chambersburg Municipal  
11 Electric - 13.5 years as Assistant Electric Superintendent; Allegheny Power – 10.5 years in  
12 Distribution and Transmission Planning; and Duquesne Light Company – over 4 years in  
13 Transmission Planning and 3 years in Operations Technology Projects.

14 **Q. What is the purpose of your testimony?**

15 A. The purpose of my testimony is to provide details supporting the installation of an  
16 Electrical Model and changes to Rider No. 21 under which Duquesne Light would install  
17 a “generation meter” at customer-generator net metered locations. Both proposals are  
18 designed to enhance Duquesne Light’s ability to efficiently and effectively manage its  
19 distribution system and assets as described more fully later in my testimony.

20

1 **I. ELECTRICAL MODEL IMPLEMENTATION**

2 **Q. Please summarize the functions and purpose of the Company's Electrical Model**  
3 **proposal.**

4 A. This proposal is designed to enhance the Company's ability to maintain and improve the  
5 grid's reliability, resiliency, and operation by modernizing the Company's process for  
6 modeling the distribution system. The proposed Electrical Model is a comprehensive  
7 computerized layout of an electric distribution system, which will be housed in the  
8 Company's existing Geographic Information System ("GIS") system, and which will  
9 represent the data on a geo-spatially correct digital map. The Company's proposed  
10 Electrical Model will illustrate connectivity from substation circuit breaker to the  
11 transformer to the customer's meter, including all switchable devices such as fuses and  
12 disconnect switches. The Electrical Model will greatly enhance Duquesne Light's ability  
13 to analyze the distribution grid for present and future conditions.

14 As part of building and maintaining the Electrical Model, the Company would also  
15 implement a Graphic Job Design ("GJD") tool that interfaces with the Electrical Model  
16 and the work management system. This tool will allow Company personnel to make  
17 proposed changes to the distribution infrastructure information in the tool and transfer the  
18 changes into the Electrical Model when the work is completed, which will help ensure that  
19 the model is kept accurate and up-to-date. The design tool will also increase the efficiency  
20 of the engineering design staff by automating many of the various calculations during the  
21 design phase that are done manually today. The Electrical Model will be used for planning  
22 and analysis of the electric distribution system, tracing the path from the customer to the  
23 substation, identifying location of field assets and Distribution Energy Resources ("DER"),

1 and engineering design of distribution overhead and underground installations. Therefore,  
2 building and maintaining an accurate Electrical Model is essential.

3 **Q. Why is the Company proposing to build an Electrical Model?**

4 A. The Company proposes to build an Electrical Model to ensure ongoing safe and reliable  
5 operation of its distribution grid. An Electrical Model is an increasingly essential tool for  
6 operating a distribution grid in the modern era. While Duquesne Light was able to delay  
7 the need for an Electrical Model by printing basic circuit maps created by computer aided  
8 design (“CAD”) with an application called AutoCAD, the time has come to implement an  
9 Electrical Model.

10 **Q. Why does the Company require an Electrical Model?**

11 A. Presently, Duquesne Light is the only major electric distribution company (“EDC”) in  
12 Pennsylvania that does not have an electrical model of its electric distribution system. The  
13 Company’s circuit maps are instead drawn in AutoCAD, whose functionalities are limited.  
14 For example, AutoCAD circuit maps are not geospatially correct; i.e., they do not conform  
15 to any geographical coordinate system. Additionally, these circuit maps do not contain  
16 customer-to-transformer connectivity; i.e., they may not illustrate where any given  
17 customer interconnects to the electric grid. These circuit maps are also not readily  
18 electronically searchable. The Company therefore relies on paper printouts of these  
19 AutoCAD drawings to operate the distribution system.

20 The Company’s existing circuit modeling impedes the Company’s ability to  
21 conduct comprehensive distribution planning and efficient grid operation. For example,  
22 Duquesne Light currently receives approximately 40-50 DER interconnection applications  
23 each month, and has installed over 18 Megawatts (MW) of DER, mostly rooftop solar,

1 through January 2018. The number of applications and installations is on the rise; in fact,  
2 11 MW of the 18 MW were installed in 2017. Currently, the Company analyzes each  
3 application to determine its effects on the attached electrical transformer and other  
4 customers served by that transformer, but the effects of these installations on the larger  
5 distribution grid and other distribution customers cannot be adequately analyzed without  
6 first being modeled in an electrical model.

7 The proposed Electrical Model will mitigate these existing shortcomings and will  
8 provide the following:

- 9 1. A single, comprehensive repository of the Company's distribution assets;
- 10 2. A centralized location for all operational maps required for distribution  
11 applications (e.g., Distribution SCADA);
- 12 3. Capabilities to trace the electrical connectivity from the substation source to  
13 each customer meter;
- 14 4. A base model for applications that enhance planning and analysis of the  
15 distribution system, including the ability to identify and optimize distribution  
16 system upgrades;
- 17 5. A study environment in which to analyze proposed changes to the distribution  
18 system, including the ability to calculate DER "host capacity" (i.e., the amount  
19 of DER that can be accommodated on a distribution circuit without impacting  
20 power quality or reliability under existing control and infrastructure  
21 configurations), placement, benefits, and effects of DER; as well as the  
22 distribution system impacts of electric vehicles and charging stations (as  
23 Mr. DeMatteo discusses in Statement No. 6);

- 1           6. Quicker and more complete and accurate access to distribution system data for  
2           the purposes of regulatory reporting;
- 3           7. Significantly improved accessibility, searchability, and durability compared to  
4           paper maps;
- 5           8. Increased employee and public safety through improved Company awareness  
6           of (a) crew locations (using Automated Vehicle Location (“AVL”) interface),  
7           and (b) customer-owned generators and/or other facilities; and
- 8           9. A foundation for other distribution system applications, such as an Advanced  
9           Distribution Management System (“ADMS”).<sup>1</sup>

10       There is an ever-increasing expectation of EDCs to increase the reliability of the  
11       distribution grid. Electric customers expect reliable power and timely communication  
12       when outages occur. An Electrical Model is necessary to enable software tools that can  
13       analyze the distribution grid so an engineer can optimize reliability projects to improve  
14       reliability indices such as SAIFI, CAIDI, and SAIDI. Along with tools that interface it  
15       with smart meter communications, an Electrical Model can also enhance the Company’s  
16       ability to predict and mitigate customer voltage issues.

17   **Q.    How does the Company plan to build the Electrical Model?**

18   A.    First, the company plans to install an Electrical Modeling tool or tools that will assist in  
19       generating a geographical database of the Electrical Model and then build the connectivity  
20       portion model that will connect the substation protective device through the circuit to the  
21       transformer and ultimately to the customer. The Electrical Model will need to interface  
22       with the Company’s customer care and billing system. Using a competitive procurement

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<sup>1</sup> In brief, an ADMS consists of an Outage Management System (OMS) and a Distribution Management System (DMS).



1 process, the Company plans to purchase the tool and place it in-service by April 2019. As  
2 the data from the field inventory are added to the Electrical Model, it will be used in by  
3 distribution planning and engineering for analysis and design, even before all of the field  
4 data are entered into the Electrical Model.

5 Second, in parallel with the Electrical Model tool installation, the Company plans  
6 to purchase and implement a GJD tool and interface it with the Company's existing GIS.  
7 The GJD tool will be used in the maintenance of the Electrical Model, and will be needed  
8 to keep the Electrical Model updated in a timely matter. The GJD tool will also be used as  
9 part of the design and implementation of new distribution infrastructure projects. Proposed  
10 projects will be designed in the GJD tool and represented in the GIS. When a project is  
11 completed, the Electrical Model will be updated with the as-built condition of the project  
12 through the interface. The GJD tool's improved interfacing with users and the Company's  
13 GIS, along with automated design quality assurance, will expedite and enhance the design  
14 process. The Company plans to purchase the tool and place it in-service by December 2019.

15 Third, the Company will conduct a field inventory of its electric distribution  
16 system. The field inventory is necessary to populate the Electrical Model with  
17 comprehensive, up-to-date data. The Company will inventory its distribution assets and  
18 collect the appropriate attributes for each asset. For example, for each pole, the Company  
19 will inventory the pole's: geographic coordinates, height, class, and attachments (including  
20 third-party attachments), and other characteristics. The inventory will also document the  
21 interconnectivity to other Company and/or customer assets. As I briefly mentioned earlier  
22 in my testimony, many of these data points are not currently included in the Company's  
23 existing circuit maps.

1           The field inventory will be conducted through one or more of several methods  
2 including, including walking pole to pole, using vehicle mounted cameras for high  
3 resolution imagery and Light Detection and Ranging (“LiDAR”) technology, using drones  
4 to capture imagery, and other real time methods to capture data. The Company would then  
5 place the collected data into the Electrical Model subject to rigorous quality assurance and  
6 quality control. The Company plans to begin the field inventory in early 2019, and  
7 complete it by December 2020. Data from the field inventory will be placed in the  
8 Electrical Model as the information is gathered and quality checked. The Company will  
9 begin replacing the CAD maps with the maps in the Electrical Model as these data become  
10 available.

11           The Company is planning to use a competitive bid process to procure a vendor for  
12 circuit map data conversion and field data gathering. The successful bidder(s) will survey  
13 and inventory the Company’s distribution system, comprising over 210,000 poles (as well  
14 as approximately 100,000 poles owned by other utilities that are connected to Duquesne  
15 Light facilities), approximately 175 stations with approximately 648 distribution and sub-  
16 transmission circuits, 5,750 miles of overhead conductor and 1,380 miles of underground  
17 cable, and approximately 100,000 distribution transformers. Additionally, The Company  
18 serves approximately 585,000 customer meters, each of which will need to be associated  
19 with a transformer and circuit as part of the field inventory.

20 **Q. What steps has the Company taken to date to develop or implement an Electrical**  
21 **Model?**

22 A. The Company has undertaken several initiatives to facilitate implementation, and drive  
23 down the cost of the proposed Electrical Model. Duquesne Light staff initially consulted

1 several in-state and out-of-state EDCs to learn from their experiences with building and  
2 operating electrical models, including gathering distribution data to populate the Electrical  
3 Model, related tools such as graphic job design tools, and user experience. Staff also  
4 participated in topical conferences and training courses in preparation for design and  
5 implementation of an electrical model.

6 The Company concurrently defined the scope and data inputs of the Electrical  
7 Model through an extensive pre-implementation analysis. In 2015, the Company  
8 assembled a comprehensive list of assets and asset attributes to be placed in the Electrical  
9 Model through a collaborative effort of experts from the various departments in distribution  
10 operations.

11 The Company then evaluated a range of techniques for developing the field data  
12 that would populate the Electrical Model. In 2016, Duquesne Light conducted a data  
13 gathering pilot project to evaluate the different approaches provided by vendors to obtain  
14 distribution field data for input to its GIS. The results of the pilot project indicated that  
15 “rubber sheeting,” a process where an image of an existing circuit map would be placed  
16 into the GIS using a few known geographic coordinate points and the remainder of the  
17 circuit is molded to the GIS land base, did not produce acceptable results. This method  
18 proved to be labor intensive to the point where it was more feasible to re-draw or digitize  
19 the circuit map. Furthermore, the AMI analytics method of determining connectivity did  
20 not produce accurate results.

21 The pilot supported digitizing Duquesne Light’s circuit maps prior to any field  
22 survey because it could reduce the time to conduct the survey. It is quicker to give a field  
23 crew a starting map where the distribution information can be verified and modified rather

1 than needing to discover and assemble all of the information. Additionally, the use of  
2 vehicle-driven LiDAR and high resolution photography was both the quickest method of  
3 gathering data and resulted in the fewest amount of errors.

4 **Q. What is the expected cost of Electrical Model implementation?**

5 A. The total projected cost for a fully populated Electrical Model is \$30.6 million. This  
6 estimate includes:

7 1. \$1.7 million of capital for software, hardware, implementation, and setting  
8 up the geo-database in the Electrical Model. This initial set-up will be completed, and the  
9 Electrical Model will be placed in service, in early 2019;

10 2. \$2.7 million of capital for software, hardware, and implementation of the  
11 GJD tool. The GJD tool will be placed in-service in 2019;

12 3. \$1.7 million of expense for business process revisions, change management,  
13 and employee training; and

14 4. \$24.5 million of expense for a field inventory, which includes data  
15 gathering, quality assurance and control, and integration of data into the Electrical Model.

16 5. Incremental annual costs associated with operating and maintaining the  
17 Electrical Model are estimated at \$0.8 million, and include software maintenance, support,  
18 and licensing costs; and Company staffing resources.

19 **Q. How was this cost estimate derived?**

20 A. The Company initially estimated the costs of the Electrical Model, with the help of  
21 consultants, as part of the Company's analysis of ADMS in 2015. The Company and the  
22 consultant contacted appropriate vendors and other electric utilities that have undertaken  
23 similar projects to gather information that led to an estimate for a Duquesne Light sized

1 utility. The company is developing an RFP to procure the Electrical Model Tool that will  
2 be released through the Company procurement team in April 2018. The Company is also  
3 developing an RFP to procure the GJD Tool that will also be released through the Company  
4 procurement team in April 2018. The company is planning to develop an RFP to procure  
5 the Field Inventory that is scheduled for release during the fourth quarter of 2018.

6 **II. RIDER No. 21- NET METERING**

7 **Q. Please describe the Company's proposed changes to Rider No. 21, Net Metering**  
8 **Service.**

9 A. The Company proposes to amend Rider No. 21 to provide that, going forward, the  
10 Company will install an additional meter ("Generation Meter") at each net metered  
11 generation facility to measure the facility's generation output.

12 **Q. Why is the Company proposing to install Generation Meters?**

13 A. The purpose of the Generation Meters is to assist the Company to better accommodate net  
14 metered facilities in the planning, design, and operation of its electric distribution system.  
15 As discussed earlier in my testimony, the Company has experienced a rapid increase in the  
16 number of customers seeking service under Rider No. 21, and the aggregate energy output  
17 of their generation installations. These customers are currently served through a bi-  
18 directional meter that allows the Company to measure the customer-generator's net energy  
19 usage, but not their actual generation output. This yields an incomplete picture of the  
20 customer-generator's impacts on, and requirements of, the distribution system. Under this  
21 proposal, the customers would continue to have a bi-directional meter to measure net  
22 energy usage, but the Company would install an additional generation meter to measure  
23 total generation output.

1           The growth of net metered installations has the potential to significantly affect  
2           Duquesne Light's distribution system, and may pose reliability concerns. Solar  
3           installations, for example, tend to yield relatively variable and unpredictable energy output.  
4           As areas of the distribution system become saturated with such installations, they may  
5           begin to experience more frequent and severe voltage fluctuations, thermal overload  
6           conditions, and unplanned outages. Additionally, because the Company currently has  
7           limited visibility into net metered facilities' actual performance, the Company must plan  
8           and operate its distribution system without relying on their ancillary capacity to offset  
9           system peak load.

10 **Q. How will the Company's proposal address these issues?**

11 A. Generation Meters will enable the Company to measure customer-generators' actual  
12 generation output, energy consumption, and peak load. These data will inform more  
13 comprehensive system planning based upon actual load and generation capability,  
14 including load growth-capacity planning and assessing power quality during variations in  
15 generating facility output. The generation timing and volume data available through  
16 Generation Meters may ultimately allow the Company to place greater reliance on DER as  
17 part of its long-term distribution system planning. These data would also expand the  
18 Company's ability to perform technical studies related to system performance and power  
19 quality.

20 **Q. How does the Company plan to implement this proposal?**

21 A. The Company proposes to install Generation Meters at all net metered facilities for which  
22 applications are submitted after December 31, 2018. The Company would own and bear  
23 the costs of these Generation Meters. The proposed requirement for a Generation Meter

1 would be prospective only. It would not apply to net metered facilities interconnected, or  
2 those for which a Level 1 application has been submitted, prior to the effective date of the  
3 proposed change. The Company may install Generation Meters at some of these  
4 “grandfathered” net metered facilities (including, for example, those in areas with  
5 anticipated high saturation of DERs) on a case-by-case basis. The Company would bear  
6 the costs of such retrofits.

7 **Q. Would this proposal affect how net metered customers are billed?**

8 A. No. The Company will continue to use a single bi-directional meter for all billing-related  
9 purposes, including measurement of customer-generators’ net consumption and/or excess  
10 generation credits. Net metered customers would therefore experience no change in the  
11 manner, speed, or degree at which they realize the benefits of net metering.

12 **Q. How would this proposal affect customer costs?**

13 A. This proposal would yield minimal costs to customers. As discussed above, the Company  
14 would own and bear the costs of the Generation Meters themselves. Customers filing new  
15 DER interconnection applications would be responsible for installing a meter socket to  
16 accommodate the Generation Meter, at an estimated one-time cost of approximately \$75.

17 **Q. Does this conclude your Direct Testimony at this time?**

18 A. Yes.

**BEFORE THE  
PENNSYLVANIA PUBLIC UTILITY COMMISSION**

**Docket No. R-2018-3000124**

**Duquesne Light Company**

**Statement No. 6**

**DIRECT TESTIMONY OF JOSEPH G. DEMATTEO**

**Date: March 28, 2018**



1 **Q. Please state your full name and business address.**

2 A. My name is Joseph G. DeMatteo. My business address is Duquesne Light Company, 411  
3 Seventh Avenue, Pittsburgh, PA 15219.

4 **Q. What is your position at Duquesne Light Company?**

5 A. I am employed by Duquesne Light Company (“Duquesne Light” or “Company”) as  
6 Director, Business Development.

7 **Q. How long have you worked at Duquesne Light?**

8 A. I have been employed by Duquesne Light Company since June 2016.

9 **Q. What are your current responsibilities?**

10 A. As the Director, Business Development, my primary responsibilities include developing  
11 the Company’s long-term business strategy and overseeing the *Business Customers*  
12 division within the Customer Service organization.

13 In developing the Company’s long-term business strategy, I am in charge of creating the  
14 Company’s vision and plan to address a myriad of exogenous factors impacting the electric  
15 utility industry. This includes responding to customers’ changing electricity consumption  
16 needs and preferences, and evaluating and piloting new technologies within the Company’s  
17 electric distribution business.

18 The Company’s *Business Customers* division within the Customer Service organization is  
19 comprised of a Manager, Business Customers and ten business customer account  
20 representatives. In leading this division, I am responsible for the account management of  
21 all non-residential customers, with the group serving as the primary point of contact  
22 between these customers and Duquesne Light. The team supports all of the electric  
23 distribution service needs of business customers, including but not limited to providing

1 billing support, project management oversight for service installations and upgrades, and  
2 outage scheduling and coordination.

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

4 A. I have been employed in the electric power generation and distribution industry since 2012.  
5 Prior to joining Duquesne Light Company, I was employed at NextEra Energy Resources,  
6 LLC (“NextEra Energy Resources”), the unregulated subsidiary of NextEra Energy, Inc.  
7 (NYSE: NEE). NextEra Energy Resources is the world’s largest generator of renewable  
8 energy from the wind and the sun, and operates a fleet of electric generating assets with  
9 total capacity of approximately 20 gigawatts. At NextEra Energy Resources, I held a  
10 variety of commercial, business development, and finance positions including Manager –  
11 Project Valuation, Manager – Distributed Generation Development, and Director –  
12 Mergers & Acquisitions.

13 Prior to my employment at NextEra Energy Resources, LLC, I was a Director in the  
14 Valuation Advisory Services practice of Duff & Phelps, LLC, a leading global financial  
15 advisory services firm. In this role, I was responsible for originating new business  
16 opportunities in addition to the execution of complex financial advisory services  
17 engagements for primarily Fortune 500 customers operating in the electric power  
18 generation and utility sectors.

19 I have a B.S. in finance from the Pennsylvania State University, where I graduated with  
20 highest distinction.

1 **Q. Are you sponsoring any exhibits, parts of exhibits or responses to the Commission’s**  
2 **filing requirements as part of your direct testimony?**

3 A. **Exhibit JD – 1:** “A U.S. Consumer’s Guide to Electric Vehicles” published by the Electric  
4 Power Research Institute (“EPRI”) in February 2018

5 **Exhibit JD – 2:** City of Pittsburgh Executive Order No. 2017-08, Subject: Reinforcing  
6 Pittsburgh’s Commitment to the Global Partnership on Climate Change

7 **Exhibit JD – 3:** “Driver’s Checklist: A Quick Guide to Fast Charging” published by  
8 ChargePoint

9 **Q. Please explain how these filing requirements were prepared.**

10 A. All filing requirements were prepared either by me or under my direct supervision. They  
11 were prepared, to the best of my knowledge, in accordance with Commission requirements  
12 and practice.

13 **Q. What is the purpose of your direct testimony regarding Duquesne Light’s request for**  
14 **increased rates?**

15 A. The purpose of my testimony is to address the following:

16 1. **Duquesne Light’s *EV ChargeUp Pilot***

17 The purpose of my testimony is to present the Company’s proposal to implement the  
18 *EV ChargeUp Pilot* (the “Pilot”) in Duquesne Light’s service territory. Within my  
19 testimony, I will: 1) describe why the Company is proposing the Pilot and how it is  
20 supported by national, state, and local market trends; 2) outline how transportation  
21 electrification (“TE”) potentially impacts the electric distribution grid and how better  
22 understanding these impacts is critical to system planning; 3) describe in detail the

1 proposed Pilot; 4) provide cost estimates related to the Pilot; and 5) explain how the  
2 Company proposes to recover costs associated with the Pilot.

### 3 **2. LED Street Light Program**

4 Beginning in May 2014 and consistent with the settlement in the Company's 2013 rate case  
5 proceeding at Docket No. R-2013-2372129, Duquesne Light has implemented a Light  
6 Emitting Diode ("LED") Street Light Pilot Program. Within my testimony, I will: 1) detail  
7 the LED Street Light Pilot Program, including how it has been implemented; 2) explain  
8 the benefits of the LED Street Light Pilot Program; and 3) describe proposed changes to  
9 the LED Street Light Pilot Program and Rate SM to include additional LED alternatives.

## 10 **ELECTRIC VEHICLE AND CHARGING PILOT PROGRAM**

11 **Q. Why is the Company proposing a pilot program with regard to electric vehicles**  
12 **("EVs")?**

13 The Company is proposing the Pilot for the following reasons:

- 14 1) Market trends, particularly those observed within the Company's service territory,  
15 indicate a broad movement towards TE and vehicles utilizing the electric  
16 distribution grid as a fuel source;
- 17 2) Based on these trends and the expected growth of EV adoption over the next several  
18 years, the Pilot is necessary to assist Duquesne Light in evaluating the impacts EVs  
19 have on the electric grid and inform the Company's distribution system planning.  
20 Working with customers, the Pilot will help the Company generate data and  
21 understanding to mitigate unexpected impacts to the distribution system and  
22 maximize the benefits of TE for all customers and communities the Company  
23 serves;

1           3) Customers will need information regarding the Pilot along with basic education and  
2           information regarding vehicle electrification to help them transition to a  
3           transportation environment that is forecast to increasingly rely on connecting to the  
4           Company’s grid and electricity as a fuel source; and

5           4) The Pilot aligns with a May 2012 Forum held by the Commission to “*explore how*  
6           *the PUC can foster policies and regulatory frameworks that support the*  
7           *development of natural gas and electric vehicles and their required*  
8           *infrastructure.*”<sup>1</sup>

9   **Q.    Please discuss TE market trends and drivers observed at the national, state, and local**  
10   **levels.**

11   **A.    National TE Market Trends & Drivers**

12       ***Light Duty Passenger EVs***

13       Light Duty Passenger EV adoption is growing across the United States. Growing customer  
14       demand, EV technological advancements, and greenhouse gas (“GHG”) emissions and  
15       clean air policies are all converging towards the delivery of an increasing number of new  
16       vehicles that connect to the electrical grid. In 2017, according to data obtained from EPRI,  
17       nearly 195,000 plug-in EVs<sup>2</sup> were sold in the United States, an increase of approximately  
18       30% over prior year totals. Since 2010, over 782,000 EVs have been sold nationwide.

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<sup>1</sup> Quote from *Pennsylvania Public Utility Commission Annual Report 2011-12*

<sup>2</sup> Plug-in EVs include plug-in hybrid electric vehicles (“PHEVs”) and all electric vehicles (“BEVs”). PHEVs are powered by an internal combustion engine that can run on conventional fuel and an electric motor that uses energy stored in a battery that can be plugged in to an electric power source to charge the battery. All electric vehicles or BEVs use a battery to store electricity that powers the motor and are charged by plugging the vehicle into an electric power source (source: <https://www.afdc.energy.gov/vehicles/electric.html>).

1 From compact cars to luxury sedans, crossovers to minivans, about forty EV makes and  
2 models are available today across the country (see Exhibit JD - 1). Soon, drivers in the  
3 United States will have even more choices, with approximately ninety EV makes and  
4 models projected by 2022, a third of which have been announced to be crossovers or SUVs  
5 (see Exhibit JD - 1). Substantiating this projection is the fact that several major automakers  
6 have recently made public pronouncements regarding their near-term vehicle  
7 electrification commitments, including:

- 8 • In January 2018, Ford announced it will increase its investment in vehicle  
9 electrification to \$11 billion by 2022 and have 40 EVs in its model lineup, including  
10 16 BEVs;
- 11 • In December 2017, Toyota announced it is projecting to spend more than \$13 billion  
12 in battery technology through 2030, with plans to launch more than ten BEV models  
13 globally by the early 2020s and electrify its entire fleet by 2025;
- 14 • In October 2017, General Motors announced it will launch two new BEV models in  
15 the next 18 months and at least eighteen more electric and fuel cell vehicles by 2023;
- 16 • In September 2017, the Renault, Nissan, & Mitsubishi Alliance - currently the number  
17 one seller of BEVs in the global market - announced the launch of twelve additional  
18 BEV models by 2022;
- 19 • In September 2017, Volkswagen AG (“VW”) announced plans to electrify its entire  
20 fleet by 2030, encompassing three hundred models across its twelve brands and  
21 representing a total investment of approximately \$84 billion;

- 1 • In September 2017, BMW announced it will offer twenty-five electrified vehicle  
2 models by 2025, with twelve being BEV models; and
- 3 • In July 2017, Volvo announced that every vehicle it offers beginning in 2019 will have  
4 an electric motor.

5 These automaker announcements are the clearest indication yet that EV technology is  
6 maturing rapidly, as battery costs continue to decline, leading to lower EV prices, longer  
7 vehicle electric ranges, and increased fuel savings. In fact, some studies now project the  
8 EV Total Cost of Ownership (“TCO”) - the total cost of purchasing, running, fueling, and  
9 maintaining a vehicle over a specified period and mileage, less the residual value – will  
10 approach parity with internal combustion engine (“ICE”) vehicles by 2025.

11

12 It is also worth noting, the VW Diesel Emissions Settlement with the U.S. Environmental  
13 Protection Agency (“EPA”) and Federal Trade Commission (“FTC”) from 2016 and 2017  
14 will help significantly accelerate the market for passenger EVs in the United States over  
15 the next decade. As part of the settlement, VW will invest the majority of \$2.0 billion (the  
16 Zero Emission Vehicle – “ZEV” – Investment Plan) in EV charging infrastructure across  
17 the country through its *Electrify America* subsidiary (some allocation will be dedicated to  
18 program administration, marketing, and education aimed at increasing public awareness of  
19 zero emission vehicles). In addition to the ZEV Investment Plan, to mitigate environmental  
20 damages resulting from violations of the Clean Air Act, the settlement requires VW to  
21 contribute \$2.9 billion in an independently administered trust to fund projects that will  
22 reduce diesel emissions, including TE-focused projects. Trust beneficiaries (including

1 states, tribes, Puerto Rico, and the District of Columbia) will establish plans to disburse the  
2 trust funds to qualifying projects<sup>3</sup>

### 3 ***Other Transportation Segments***

4 The momentum observed in the light duty passenger EV market is just one example of the  
5 fundamental shift toward TE projected in the near future. Other transportation segments  
6 are also moving towards electrification including:

- 7 • ***Electric Buses*** - there are at least three major Original Equipment Manufacturers  
8 (“OEMs”) - Proterra, BYD, and New Flyer - and numerous after-market conversion  
9 companies now deploying electric buses across the country. While the industry is still  
10 nascent – it is estimated only 1% of the approximately 70,000 transit buses in the United  
11 States are currently electric<sup>4</sup> - OEMs are expanding operations to address a market that  
12 is forecast to grow in the near future. Proterra recently opened a new manufacturing  
13 facility outside Los Angeles to ramp up production to approximately 400 electric buses  
14 per year to meet growing customer demand and a waiting list of orders from transit  
15 authorities across the country. Additionally, BYD opened the expansion of its  
16 manufacturing facility in northern Los Angeles in October 2017 that will allow the  
17 company to build 1,500 electric buses annually and deliver 300 buses by mid-2018,  
18 more than double the number of electric buses delivered to BYD’s existing 40  
19 customers in North America to date<sup>5</sup>. Lastly, as of January 2018, all of New Flyer’s

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<sup>3</sup> For additional information regarding the VW ZEV Investment Plan and Emissions Mitigation Trust, please reference <https://www.electrifyamerica.com/> and <https://www.vwenvironmentalmitigationtrust.com/>, respectively.

<sup>4</sup> <https://insideclimatenews.org/news/18102017/these-city-bus-routes-are-going-all-electric>

<sup>5</sup> <http://www.businessinsider.com/byd-warren-buffett-expands-facility-electric-bus-2017-10>



1 facilities were equipped to manufacture its line of electric buses to meet growing  
2 customer demand in this space<sup>6</sup>.

3 While the number of and growth of electric bus adoption may lag that of light duty  
4 passenger EVs, the concentrated electrical system impacts and incremental load  
5 opportunities resulting from electric bus adoption are expected to be significant,  
6 creating an urgent, immediate need to begin assessing TE charging impacts on the  
7 Company's electric distribution grid through the Pilot.

- 8 • **Shared mobility and Transport Network Companies (“TNCs”)** - Shared mobility is  
9 often viewed in the context of two other revolutions in the transportation sector, namely  
10 vehicle electrification and vehicle autonomy. Shared mobility when partnered with electric  
11 propulsion leads to more efficient use of the vehicles and energy, while addressing traffic  
12 congestion and local air quality. Automakers and other companies are increasingly  
13 launching TNCs across the nation, from GM's Maven, Ford's Chariot and BMW's  
14 ReachNow to Lyft and Uber. According to McKinsey and Co., the U.S. market for share  
15 mobility is approximately \$23 Billion. Industry stakeholders suggest that shared mobility  
16 will help light duty passenger EVs become more prolific because of the significant increase  
17 in vehicle use which helps strengthen the TCO equation. As was recently announced,  
18 Duquesne Light has partnered with one of its customers, Uber, in Pittsburgh as Uber looks  
19 to encourage Uber Drivers to purchase or lease EVs to meet vehicle electrification goals,  
20 and Duquesne Light looks to assist this effort through the installation of DC Fast Charging  
21 infrastructure (discussed further below).

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<sup>6</sup> <https://www.newflyer.com/2018/01/new-flyer-facilities-now-capable-manufacturing-xcelsior-charge-battery-electric-buses/>

1           ***Federal Incentives – EV Tax Credit***

2           The Qualified Plug-In Electric Vehicle Tax Credit is available for the purchase of a new  
3           qualified plug-in EV that draws propulsion using a traction battery that has at least five  
4           kilowatt-hours (“kWh”) of capacity and uses an external source of energy to recharge the  
5           battery. The minimum credit amount is \$2,500, and the credit may be up to \$7,500, based  
6           on each vehicle's traction battery capacity and the gross vehicle weight rating. The  
7           availability of this federal tax credit favorably impacts the TCO calculation as prospective  
8           drivers evaluate purchasing EVs versus ICE vehicles, and is expected to continue driving  
9           adoption of EVs into the foreseeable future.

10          **State TE Market Trends & Drivers**

11          In 2017, according to data from EPRI, registrations of electric vehicles in Pennsylvania  
12          increased nearly 37% over the prior year, and some models project to grow by a factor of  
13          almost 7x to potentially over 84,000 by the end of 2022. In addition to the national EV  
14          trends discussed above, there are several state-level drivers contributing to the observed  
15          and projected acceleration in EV adoption.

16          ***State Incentives***

17          The Pennsylvania Alternative Fuels Incentive Grant (“AFIG”) Program was established in  
18          1992 and was created to promote and build markets for advanced, renewable and  
19          alternative energy transportation technologies. Three opportunities offered under the  
20          AFIG include 1) the Alternative Fuels Incentive Grant, 2) the Pennsylvania FAST Act  
21          Corridor Infrastructure Grant, and 3) the Alternative Fuels Technical Assistance Program<sup>7</sup>.  
22          Notably, the PA Department of Environmental Protection (“DEP”) has awarded grant

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<sup>7</sup> Details of the AFIG program can be found on the Pennsylvania DEP website -  
<http://www.dep.pa.gov/citizens/grantsloansrebates/alternative-fuels-incentive-grant/pages/default.aspx>

1 funding under the AFIG program for organizations interested in retrofitting existing  
2 vehicles to operating on alternative fuels, purchasing new alternative fuel vehicles, and  
3 installing fueling infrastructure for alternative fuel vehicles, all of which include EVs and  
4 EV charging infrastructure as eligible. The PA DEP anticipates re-opening the AFIG  
5 program later in 2018 according to its website as of the time of this filing (see footnote for  
6 link to PA DEP AFIG website).

7 ***Drive Electric PA Coalition***

8 In 2016, the Pennsylvania DEP began collaborating with stakeholders statewide in a  
9 planning process to increase the acceptance and adoption of electric vehicles by state  
10 government agencies, local governments, businesses, industry, and the general public  
11 across the state. Three subcommittees were formed to develop plans, goals, and activities  
12 related to 1) Education and Outreach, 2) EV Procurement, and 3) EV Charging  
13 Infrastructure. Additionally, the Coalition engaged an expert transportation consultant to  
14 create the "Pennsylvania Electric Vehicle Roadmap" to help inform policymakers  
15 interested in supporting EV growth in Pennsylvania. Duquesne Light, along with the City  
16 of Pittsburgh and other local stakeholders, is an active participant in the quarterly meetings  
17 held by the Coalition and is a co-chair on the Education and Outreach subcommittee.

18 ***VW Settlement – Environmental Mitigation Trust***

19 As a beneficiary to the aforementioned VW Environmental Mitigation Trust, Pennsylvania  
20 is slated to receive approximately \$120 million that may be disbursed over the next ten  
21 years towards various segments of TE, including up to 15% on light duty passenger EV  
22 charging infrastructure. Pennsylvania has designated the DEP as its Lead Agency  
23 responsible for administering the VW Environmental Mitigation Trust funds. In its draft

1 Beneficiary Mitigation Plan circulated in May 2017, the Pennsylvania DEP stated that it  
2 would focus on distributing funds to projects “located in areas with high population  
3 density”, specifically noting Pittsburgh. These facts further exemplify yet another market  
4 trend that indicates an acceleration in the TE market in state as well as the Company’s  
5 service territory.

### 6 **Local TE Market Trends & Drivers – Duquesne Light Service Territory**

7 In 2017, according to data obtained from EPRI, registrations of electric vehicles in the  
8 Company’s service territory increased nearly 35% over the prior year and exceed more  
9 than 1,450 EVs as of the end of 2017. According to projections prepared by EPRI,  
10 significant growth in the adoption of EVs is expected over the next five years, with  
11 registrations estimated to potentially exceed 9,000 by 2022, over 6x existing EV  
12 registrations. Taking into consideration these projections and the market trends described  
13 above, the Company views its service territory as a burgeoning EV market poised for  
14 marked growth in the near future that must be taken into consideration in distribution  
15 system planning. Notably, this growth story is further supported by specific TE initiatives  
16 publicly announced by two of the Company’s large customers and most significant regional  
17 stakeholders – the City of Pittsburgh and the Port Authority of Allegheny County  
18 (“PAAC”).

#### 19 ***City of Pittsburgh***

20 In June 2017, Pittsburgh’s Mayor Peduto issued an executive order pledging, among other  
21 things, the City of Pittsburgh (the “City”) would remain committed to the Paris Climate  
22 Agreement reached in December 2015. Full details of the Mayor’s Executive Order No.

1 2017-08, Subject: Reinforcing Pittsburgh’s Commitment to the Global Partnership on  
2 Climate Change (the “Executive Order”) can be found in my exhibits (see Exhibit JD - 2).

3 While the Executive Order contains several directives focused on addressing emissions  
4 reductions and climate change, the following actions specifically target TE and the  
5 associated impacts of vehicle electrification on these items:

- 6 • Development of a fossil-fuel free City fleet by 2030.
- 7 • 50% transportation emissions reductions city-wide by 2030.
- 8 • Quantifying the impact of greenhouse gas (“GHG”) emissions reductions and air  
9 quality improvements related to:
  - 10 ○ the electrification of transportation systems in conjunction with renewable  
11 energy sources;
  - 12 ○ the transition of the City of large-scale fleet operations to electric or other  
13 renewable power resources; and
  - 14 ○ the encouragement of adoption of electric vehicle technologies by the  
15 City’s citizens.

16 The Mayor’s commitment to TE and its impact on climate change, as evidenced by the  
17 Executive Order described above, is expected to be a key accelerant to the adoption of EVs  
18 and related technologies in the Company’s service territory and is a key impetus to the  
19 Company proposing the Pilot. Through the Pilot, Duquesne Light will be able to support  
20 the City in meeting its vehicle electrification goals.

21

1           **PAAC**

2           Separate from the Mayor’s TE initiatives described above, the PAAC has begun planning  
3           to electrify its fleet of over seven hundred buses. Beginning in 2016, the PAAC started  
4           evaluating electric buses by inviting the three aforementioned OEMs to test models on  
5           service routes in Allegheny County. Additionally, in September 2017, the PAAC secured  
6           \$500,000 in federal grant money to subsidize the purchase of its first electric bus. Perhaps  
7           most significantly, the PAAC, in conjunction with the City and Allegheny County, is  
8           planning a Bus Rapid Transit (“BRT”) system between the Oakland and Downtown areas  
9           in the City that would be powered by 25 articulated electric buses. The design of the BRT  
10          project is expected to be completed in 2018, with construction expected to be completed  
11          by the end of 2020. While the PAAC and supporting organizations have applied for federal  
12          funding, as recently as February 2018, the Executive Director of Allegheny County, Rich  
13          Fitzgerald, stated that the project will proceed with or without federal funding.

14          Through the PAAC’s commitment to electric buses, customers throughout Allegheny  
15          County will be able to experience the benefits of TE. This commitment, combined with  
16          the Mayor’s climate change objectives, contribute to the region’s clean energy initiatives,  
17          which are critical attraction criteria to prospective economic development and new  
18          business opportunities for the region (e.g. Amazon HQ2). Helping the PAAC meet its  
19          vehicle electrification goals is yet another impetus for the Company proposing the Pilot.

20          **Market Trends & Drivers Summary**

21          Given the national, state and local market trends and drivers described above, the Company  
22          believes the time is right to conduct the Pilot to help both the utility and the Commission  
23          fully understand and prepare for the accelerated adoption of TE and deployment of EV

1 charging infrastructure at residential, commercial and industrial customer sites across the  
2 service territory.

3 As the Company will describe in further detail below, the Pilot is designed to help the  
4 Company understand costs, complexities, and implications of deploying EV charging  
5 infrastructure for customers, and ways to help manage and minimize system impacts of TE  
6 across different transportation segments. Additionally, the Pilot aligns with the Company's  
7 goal as a next generation electric utility of being a trusted energy advisor for its customers.  
8 Lastly, the Pilot will inform and support enhanced distribution system planning and align  
9 with the Company's grid modernization investments.

10 **Q. How does the penetration of electric vehicles impact the electric distribution system?**

11 **A.** Many utilities across the country have, or are in the process of evaluating the impact of  
12 TE on the electric distribution grid. Generally, utilities are focusing on:

13 **Evaluating local distribution system impacts** - local distribution grids are not built to  
14 accommodate the significant potential spikes in demand with electric cars. Transformers,  
15 which connect every home and business to the distribution grid, are the most vulnerable  
16 and affected equipment on the system. As an example, the Company's typical residential  
17 transformers serve approximately 5 to 15 customers and are rated at either 37.5 kVA or  
18 50 kVA. These transformers are sized such that during peak periods they are loaded near  
19 capacity based on typical customer demands. A single EV charging from a Level 1 (120  
20 V) or Level 2 (240 V) station uses approximately 2 kVA or 7 kVA, respectively.  
21 Multiple EVs charging at the same time (i.e. "charge clustering") could cause transformer  
22 overloading and result in system upgrades. System impacts associated with charge  
23 clustering can be further exacerbated considering system load typically peaks near the

1 time commuters arrive home from work, at the same time those commuters are looking to  
2 recharge their EVs. Similar examples and impacts associated with charge clustering can  
3 be applied to other EV charging use cases (workplace, multi-unit dwellings, fleet parking,  
4 etc.) as well.

5 The Pilot will enable the company to better understand system impacts related to EV  
6 charging, and utilize this information to inform future system planning. This proactive  
7 planning approach is more efficient and cost effective than reactive measures that may be  
8 necessary in the overloading example described above.

9 **Understanding Benefits of managed charging** - The case for managed charging, also  
10 known as smart or intelligent charging, entails a combination of infrastructure and  
11 communication signals sent directly to a vehicle or via a charger to influence the driver's  
12 decision on when to charge the car. The Pilot will evaluate the benefits of managed  
13 charging to help mitigate potential system impacts.

14 **Public Benefits of EVs** - the public benefits of EVs and their connection to the electrical  
15 grid have been discussed extensively across the country through other utilities' regulatory  
16 filings. Several studies have been conducted supporting the position that EVs connecting  
17 to the electrical grid benefit all ratepayers regardless of whether or not they own an EV.  
18 Additionally, studies indicate that plug-in EVs, with low to no tailpipe emissions, have  
19 lower emissions than comparable ICE vehicles today and are expected to only get "cleaner"  
20 as electricity is generated by an increasing amount of renewable and efficient natural-gas  
21 fired generation. Locally, as discussed above, the Company plans to install EV charging



1 infrastructure to support the PAAC's fleet electrification goals. Supporting public transit  
2 electrification allows customers across all income levels to realize the benefits of TE.

3 The Company has designed the Pilot to help it better understand the benefits and  
4 implications of TE load on the Company's distribution system.

5 **Q. Please describe the Company's proposed *EV ChargeUp Pilot* and the program's**  
6 **objectives.**

7 **A.** There are three segments to the Company's proposed *EV ChargeUp Pilot*: 1) EV Charging  
8 Infrastructure Evaluation, 2) EV Education & Outreach, and 3) Customer EV Registration  
9 Incentives. Each of these segments are described in further detail in the sections below,  
10 and have been carefully designed to accomplish the Pilot's key objectives as detailed  
11 above. Additionally, in designing the Pilot program, the Company established and adhered  
12 to the following *Guiding Principles*.

### 13 **Pilot Guiding Principles**

#### 14 **1. Support state and local EV policies and goals**

- 15 ○ The Company will engage with its customers, such as the City and the  
16 PAAC, to help them meet their vehicle electrification goals and help  
17 facilitate the connection of TE to the electrical distribution system.

#### 18 **2. Support a competitive charging market while maintaining market neutrality**

- 19 ○ The Company will engage with the competitive charging industry, foster  
20 competition, innovation and equipment and network choice without  
21 picking winners and losers.

1           **3. Maintain site host choice and control**

- 2                   ○ The Company will promote customer-site host equipment choice and  
3                   charging control and enable customer-site hosts to choose how or if to bill  
4                   EV drivers for charging services.

5           **4. Ensure equipment is installed safely and maintained efficiently**

- 6                   ○ The Company will require customer-site hosts participating in the Pilot to  
7                   contribute financially to help ensure equipment is deployed safely and  
8                   utilized and maintained effectively.

9           **5. Require detailed data from program participants**

- 10                  ○ The Company will require participating customer-site hosts and authorized  
11                  equipment and network providers to provide detailed data, such as:
- 12                          ▪ load profiles including interval data covering charging event  
13                          duration and site specific charging load management strategies;
  - 14                          ▪ equipment performance data including but not limited to reliability  
15                          and percent utilization; and
  - 16                          ▪ driver experience data including price signals, access to user apps,  
17                          and 24/7 call center support information.

18           **6. Manage program operations and costs**

- 19                   ○ The Company will leverage its project management resources to administer  
20                   the Pilot and track program costs.

21           **1. EV Charging Infrastructure Evaluation**

22           *Overview*

23           The EV Charging Infrastructure Evaluation includes the following three programs:

- 1           • A Level 2 (see Exhibit JD - 3) EV charging infrastructure evaluation program (“L2  
2           Evaluation”) which will facilitate the deployment of approximately 65 Level 2  
3           charging stations on average annually at long dwell-time locations (i.e., four hours  
4           or more) including workplaces, multi-unit dwellings (“MUDs”), fleet parking  
5           centers, and public destination centers (e.g. shopping centers).
- 6           • A limited evaluation of DC Fast Chargers (“DC Fast Charger Evaluation”) where  
7           the Company will facilitate the deployment of and own approximately 15 DC fast  
8           charging stations to help support urban commuting, TNCs, and other quick  
9           charging applications.
- 10          • Installation of ten Level 2 EV charging stations at Company-owned facilities  
11          (“DLC Workplace Charging”) for employee use and to help the Company evaluate  
12          the benefits of managed EV charging by experimenting with different charging  
13          station management and pricing strategies to influence EV charging behavior.

14           The table below provides additional detail on the three EV Charging Infrastructure  
15           Evaluation programs.

	L2	DC Fast Charging	DLC Workplace Charging
<b>No. of Stations</b>	Average of 65 stations installed annually from 2018 - 2022	~15 stations	~10 stations
<b>Ownership Structure</b>	DLC owns “make-ready” infrastructure; customer-site host owns charging station	DLC owns “make-ready” infrastructure and charging station	DLC owns “make-ready” infrastructure and charging station
<b>Customer Rebate</b>	Yes – approx. 50% of charging station cost	No	Not Applicable
<b>Operations &amp; Maintenance</b>	DLC operates and maintains make-ready infrastructure; customer site-host operates and maintains charging station	DLC operates and maintains make-ready infrastructure; customer site-host operates and maintains charging station	DLC operates and maintains make-ready infrastructure and charging station

	L2	DC Fast Charging	DLC Workplace Charging
<b>Pricing Strategy</b>	Customer-site host chooses how to bill customer for charging session; DLC charges customer-site host at appropriate general service rate	Customer-site host chooses how to bill customer for charging session; DLC charges customer-site host at appropriate general service rate	DLC choice
<b>Capital Costs (by 12/31/19)</b>	\$1,300,000	\$1,000,000	\$200,000
<b>O&amp;M Costs</b>	Not broken out by program - total of \$442,000 annually dedicated to EV Infrastructure Evaluation Programs		

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In the L2 and DC Fast Charging Evaluation programs, the Company will earmark a minimum 10% capital investment allocation for disadvantaged/low income communities.

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Here, we intend to identify priority neighborhoods based on several sources of information including but not limited to census data, Duquesne Light Customer Assistance Plan enrollments, and working closely with the City of Pittsburgh and Allegheny and Beaver County leadership teams.

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In addition, the Company has engaged with the City, the PAAC, and Uber as potential initial customers under the L2 and DC Fast Charger programs, namely:

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- The Company has engaged with the City of Pittsburgh to potentially deploy L2 chargers to serve its fleet and public needs in support of the Mayor’s 2030 TE objectives described in detail above;

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- The Company has discussed potentially deploying L2 or DC fast chargers to fuel the PAAC’s initial electric bus purchases that are critical to the PAAC’s long-term fleet electrification plans and evaluating electric bus performance capabilities in advance of the BRT project; and

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- The Company has partnered with Uber to deploy DC fast chargers as a needed fuel source for current and prospective Uber-Drivers with EVs, supporting the

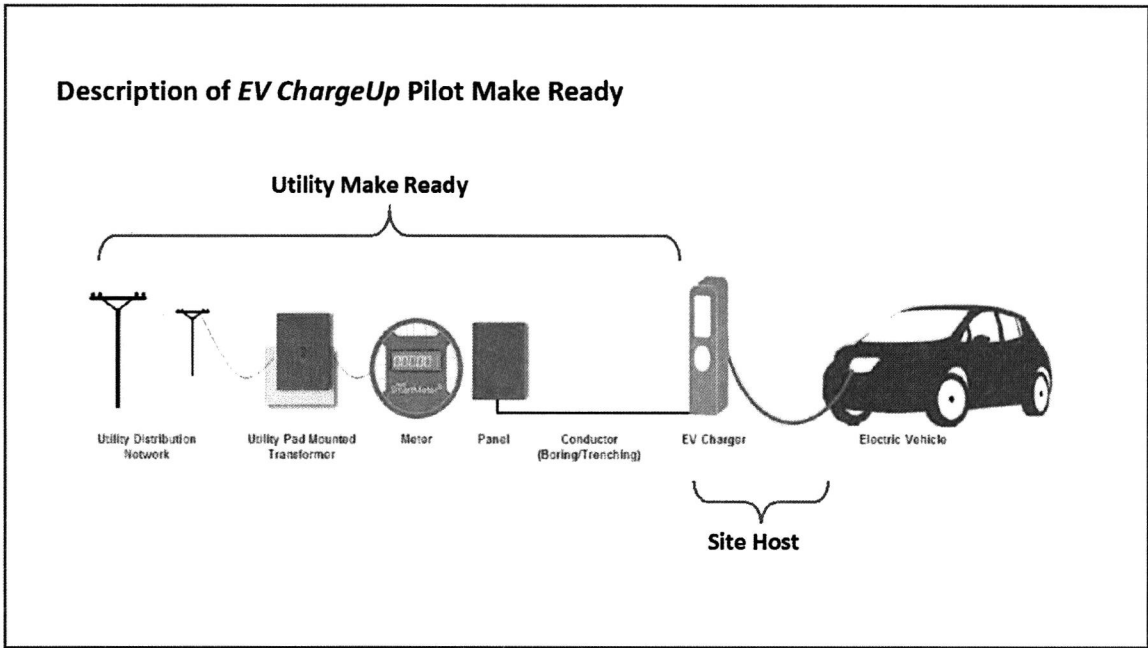
18

1           accelerated adoption of TE as a key pillar of Uber’s corporate decarbonization  
2           goals.

3           ***L2 Evaluation***

4           Targeting long dwell-time locations, the Company will work in partnership with  
5           commercial & industrial customers (“customer-site hosts”) across several EV charging  
6           market segments (e.g. workplaces, multi-unit dwellings, fleets, and destination centers) to  
7           identify potential locations to deploy L2 EV charging stations. To help achieve economies  
8           of scale and manage program costs, the L2 Evaluation will require a minimum number of  
9           charging ports per site, currently contemplated at two dual port stations per site (capable  
10          of charging four vehicles at once). In the L2 Evaluation, the Company will invest, own,  
11          and maintain the supporting infrastructure needed to serve the charging stations that the  
12          customer-site hosts will own. This supporting infrastructure, often referred to in the EV  
13          industry as the “*make ready*”, includes:

- 14           • the electric distribution service drop;
- 15           • new transformer (including transformer pad) or transformer upgrades, as necessary  
16           to serve the new EV charging station load;
- 17           • separate utility service meter (one for the entire “bank” of EV charging stations);
- 18           • new electric service panel; and
- 19           • all the associated conduit and conductor necessary to connect the EV charging  
20           stations at the electrical “stub” (see diagram below).



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The customer-site hosts will procure, own, operate and maintain the level 2 EV charging stations, subject to certain qualification criteria from a Duquesne Light-approved and authorized vendor list (additional information provided below). Expenses related to the purchase, installation, and operation (including networking fees) and maintenance of the EV charging stations will be borne by the customer-site hosts. To encourage the customer-site hosts to purchase the Duquesne Light-approved level 2 EV charging stations and to provide the Company with charging session transactional data for 5 years, the Company will offer a rebate per charging station of 50% of the base cost of the charging equipment. The actual amount will be determined based on an open request for proposal (“RFP”) process that the Company will conduct to qualify charging station equipment and vendors. Customer-site hosts will receive electric service to the separately metered EV charging stations from the Company under the appropriate general service rates within the

1 Company's retail electric tariff, and will have the choice to bill or not bill EV drivers for  
2 charging services, consistent with Rule 18 of the Company's tariff.

### 3 *DC Fast Charger Evaluation*

4 Duquesne Light is proposing to assess the potentially significant system impacts from the  
5 concentrated, peak charging patterns associated with DC fast charging by installing and  
6 owning a limited number of charging stations through the Pilot.

7 Similar to the L2 Evaluation, Duquesne Light will own and maintain the "make ready"  
8 infrastructure needed to supply electricity to the charging stations. However, unlike the  
9 level 2 EV charger market, the upfront equipment costs of DC fast chargers are high,  
10 typically in excess of \$25,000 for networked dual port 50 kW units, with higher power  
11 models beginning to enter the market at costs multiples of that. These higher equipment  
12 costs (relative to level 2 EV chargers) combined with low early-stage market levels of  
13 utilization can negatively impact and deter customer investment in DC fast chargers.  
14 Therefore, DLC proposes to own the charging stations for the Pilot. To maintain a  
15 competitive market environment and similar to the L2 Evaluation program, the customer-  
16 site hosts will operate and maintain the DC fast charging stations of their choice (selected  
17 from the Duquesne Light-authorized list) at their expense, including networking fees, and  
18 provide the utility with transactional data for a period of 5 years. Also consistent with the  
19 L2 Evaluation program, customer-site hosts will receive electric service to the separately  
20 metered EV charging stations from the Company under the appropriate general service  
21 rates within the Company's retail electric tariff, and will have the choice to bill or not bill  
22 EV drivers for charging services, consistent with Rule 18 of the Company's tariff.

1 The following chart summarizes the roles and responsibilities under the L2 and DC Fast  
 2 Charger Evaluation programs:

Duquesne Light	Customer-site host
Issue an RFP to create a pre-approved list of L2 and DC fast charging stations	Select, procure, and own L2 charging stations from DLC-approved list
Collaborate with multiple third-party providers for equipment, installation and other services as needed and maintain a rolling list of authorized equipment and network providers throughout the Pilot	Select DLC owned DC fast charging stations from DLC-approved list
Offer several models of L2 and DC fast charging stations with specific functionalities, including demand response capabilities	Choose the type of payment system for the charging station, if any, and the type of networking services
Provide rebates to customer-site hosts to subsidize the purchase of DLC approved and specified charging stations	Decide on the number of EV charging stations and approve the final site plan based on DLC program requirements
Own and maintain “make ready” infrastructure to the charging station stub	Allow, through easements, access to customer electric panel, charging station, and related infrastructure to DLC and its subcontractors
Install a separate utility meter so the Company can study and assess TE charging behavior	Operate and maintain EV charging stations directly or through third party service providers
Procure and own DC fast charging stations at customer-site host locations	Agree to participate in any EV charging load management programs DLC may decide to implement
Generate data and understanding of EV charging infrastructure costs, operation and maintenance as well as how price signals and can modify charging behavior	Pay for L2 charging station equipment costs (net of DLC rebate) and the cost of operating and maintaining, including network services fees, for L2 and DC fast charging stations on site
Conduct program-specific education and outreach	

3



1           ***DLC Workplace Charging Evaluation***

2           The Company also proposes to install approximately ten Level 2 dual port EV charging  
3           stations at Company-owned facilities for employee use and to facilitate the Company’s  
4           ability to experiment with different load management and pricing strategies to help  
5           evaluate and understand the benefits of managed charging.

6           ***EV Charging Station Requirements***

7           In all three of the EV Charging Infrastructure Evaluation programs, the charging stations  
8           will be required to meet certain standards-based and program technical requirements,  
9           including but not limited to, NRTL certification, Energy Star, SAE’s J1772, demand  
10          response capabilities through Open ADR and the ability to provide detailed use data to the  
11          utility. In addition, to help promote an enhanced charging experience, DLC will request  
12          vendors to demonstrate their “back office” capabilities designed to enhance the site  
13          management and EV driver charging experience including, site host charger management  
14          tools (central monitoring, use optimization, etc.) and EV driver tools (web and app based  
15          tools to help with locating a charger, reserving a charger, and providing detailed usage and  
16          costs, etc.) and dependable driver support such as 24/7 call centers to help identify and  
17          solve charging issues.

18          **2. EV Education & Outreach**

19          The EV Education and Outreach (“EV E&O”) component of the Pilot is designed to  
20          provide customers with details of the L2 and DC Fast Charging Evaluation programs and  
21          to provide customers basic education and information regarding vehicle electrification,  
22          such as the cost of EV fueling from the grid, differences in EV charging levels, how to  
23          connect EV charging equipment to the DLC grid, and the environmental impacts and other

1 benefits of EVs charging from the grid. Elements of the EV E&O component of the Pilot  
2 will include:

- 3 • An enhanced DLC EV webpage, including a new “landing page” dedicated to  
4 communication and administration of the L2 and DC Fast Charging  
5 Infrastructure Evaluation programs;
- 6 • Participation in and sponsorship of community-based events, such as local trade  
7 shows (e.g. Pittsburgh Home & Garden Show), Pittsburgh Region Clean Cities  
8 *Odyssey Day*, energy conferences held by local universities, National Drive Electric  
9 Day, EV “ride and drives”, etc.;
- 10 • Communication through a variety of channels, including but not limited to bill  
11 inserts, television campaigns, social media, digital and print media;
- 12 • L2 and DC Fast Charging Evaluation program collateral covering program  
13 overview, DLC and customer roles and requirements, program costs and benefits,  
14 customer applications, FAQs, etc.;
- 15 • Education sessions for commercial & industrial customers interested in  
16 participating in the L2 and DC Fast Charging Evaluation programs; and
- 17 • Collaboration with community based organizations to develop relevant EV  
18 messages regarding the L2 and DC Fast Charging Evaluation programs and general  
19 vehicle electrification education for low-income and disadvantaged communities.

### 20 **3. Customer EV Registration Incentives**

21 The Customer EV Incentives component of the Pilot is designed to provide DLC with  
22 information regarding the location and usage patterns of customers with EVs and to assist  
23 with future distribution system planning. Today, if a customer purchases an EV, there is

1 no requirement to notify the Company of the purchase, and thus the Company may not be  
2 able to directly observe the significant incremental usage and demand impacts once the EV  
3 is connected and fueling from the Company's distribution grid. If the Company were  
4 notified of an EV purchase and could enter it into its Electrical Model (which Mr. Karcher  
5 discusses in Statement No. 5), Duquesne Light could study the circuit impacts and more  
6 effectively incorporate this information into its distribution planning processes to mitigate  
7 reactive, and potentially more costly, transformer and distribution circuit upgrades.

8 To obtain this valuable information, the Company is proposing to offer a one-time \$60 bill  
9 credit to those customers that register their existing or new EV purchase with DLC. Based  
10 on EV registration projections for Duquesne Light service territory prepared by EPRI, if  
11 all EV owners were to register for the credit, total bill credits from 2018-2019 would  
12 amount to approximately \$225,000 and average approximately \$110,000 per year through  
13 2022.

1 **Q. What are the projected costs related to the Pilot?**

2 A. The table below provides detail regarding the projected costs of the Pilot.

<b>Projected Pilot Costs</b>			
<b>(1) EV Charging Infrastructure Evaluation</b>			
[A] L2 Evaluation	<i>Capital</i>		\$ 1,300,000
[B] DC Fast Charging Evaluation	<i>Capital</i>		\$ 1,000,000
[C] DLC Workplace Charging	<i>Capital</i>		\$ 200,000
Total			<u>\$ 2,500,000</u>
[D] L2 Evaluation Customer Rebates	<i>Expense</i>		\$ 175,000
<b>(2) EV Education &amp; Outreach</b>			
[E] EV Charging Infrastructure Program Communication & Administration	<i>Expense</i>		\$ 267,000
[F] Other EV Education & Outreach	<i>Expense</i>		\$ 90,000
Total			<u>\$ 357,000</u>
<b>(3) [G] Customer EV Registration Incentives</b>	<i>Expense</i>		\$ 110,000
<b>Additional Information</b>			
[A] Projected invested capital by December 31, 2019.			
[B] Projected invested capital by December 31, 2019.			
[C] Projected invested capital by December 31, 2019.			
[D] Estimated customer rebates on installed L2 charging stations by December 31, 2019.			
[E] Projected annual expenses related to EV Charging Infrastructure Program Communication & Administration.			
[F] Projected annual expenses related to other EV Education & Outreach activities described further in Testimony above.			
[G] Projected average annual customer bill credits for EV registration information.			

3

4 **Q. How does the Company propose to recover these investment costs?**

5 A. Items marked as “capital” in the table above are reflected in Mr. Morris’s capital plan  
6 (Statement No. 4) and will be recovered through base rates. Items marked as “expense” in  
7 the table above are reflected in Mr. Ankrum’s operating and maintenance expense budget  
8 (Statement No. 2) and will be recovered through base rates.

1 **LED STREET LIGHT PROGRAM**

2 **Q. Please explain the Company’s current LED street light program.**

3 A. In accordance with the Company’s Distribution Rate Case Settlement (the “Settlement”)  
4 approved by the Pennsylvania Public Utility Commission (“Commission”) at Docket No.  
5 P-2013-2372129, Duquesne Light commenced the LED Street Light Pilot Program (the  
6 “LED Pilot Program”) in May 2014. As part of the Settlement, the Company agreed to  
7 engage with all municipal street lighting customers in Duquesne Light service territory  
8 (154 municipalities in which the Company owns, operates, and maintains the street lights  
9 and provides service under Rate SM of the Company’s Tariff) to install up to 1,500 LED  
10 street lights per Program Year (May 1 through April 30 of the following year). Through  
11 the LED Pilot Program, the Company offers to convert high pressure sodium (“HPS”)  
12 Cobrahead fixtures at nominal lamp wattages of 70 and 150 watts to LED equivalents at  
13 43 and 106 watts, respectively. Municipalities interested in participating in the LED Pilot  
14 Program are required to submit applications by August 1 of the Program Year, and  
15 applications must include a minimum of ten contiguous street lights for conversion.  
16 Municipalities are also required to cover the cost of removal (\$109 per light) for the HPS  
17 street light fixtures, and is due prior to scheduling the conversion. Within 90 days of the  
18 end of each Program Year, as part of the Settlement, the Company submits an annual report  
19 to PennFuture, the Commission, the Bureau of Investigation & Enforcement, the Office of  
20 Consumer Advocate, and the Office of Small Business Advocate outlining various details  
21 regarding the LED Pilot Program. Lastly, the LED Pilot Program is scheduled to run

1 through the Future Test Year of the Company's Rate Case filing subsequent to the  
2 Settlement.

3 **Q. What are the benefits of the LED street light program?**

4 A. The LED Pilot Program has enabled numerous municipalities within the Company's  
5 service territory to enjoy the benefits of LED street lighting for a nominal upfront  
6 replacement cost.

7 The benefits of LED versus HPS street lighting have been thoroughly documented in  
8 industry publications. The lumen output, or brightness the light emits, of LEDs per watt is  
9 superior to HPS, and is the reason higher wattage HPS fixtures can be replaced by lower  
10 wattage LED alternatives without sacrificing brightness. This results in lower electricity  
11 (kWh) usage, as evidenced by the nominal kWh usage per unit per month in Rate SM of  
12 the Company's Tariff. By participating in the LED Pilot Program, municipalities can  
13 realize a nearly fifty percent reduction in their electricity supply usage, and potentially  
14 significant cost savings, for street lights that are converted from HPS to LED.

15 Since commencement of the LED Pilot Program, the Company has received substantial  
16 positive feedback from participating municipalities, as community leaders and residents  
17 have expressed they prefer the "white" light emitted by the LEDs and claim the converted  
18 street lights offer enhanced visibility.

19 **Q. How was this LED street light program implemented?**

20 A. To implement the LED Pilot Program, the Company has used the following process since  
21 the inception:

- 22 • At the beginning of the Program Year, the Company sends a letter announcing the LED  
23 Pilot Program, an application, and the participation requirements and guidelines to all

1           municipal street lighting customers in the Company’s service territory. These materials  
2           are sent via US mail and email to municipal, borough, and township administration.

- 3           • Representatives from the Company’s Business Customers division are assigned to each  
4           municipality to promote the LED Pilot Program, answer questions related to the  
5           program, assist with cost savings analysis, and assist with the conversion, if pursued.
- 6           • To participate in the program, municipalities must submit applications by August 1 of  
7           the Program Year, and applications must include a minimum of ten contiguously  
8           installed 70 or 150 watt HPS Cobrahead fixtures.
- 9           • Duquesne Light field personnel verify that the street lights submitted by municipalities  
10          are in a contiguous location and meet the criteria of the program (correct wattage and  
11          fixture types).
- 12          • LED street lights are allocated on a “first come, first serve” basis. If the LED Pilot  
13          Program is undersubscribed in a given Program Year, additional LED street lights may  
14          be allocated to interested municipalities, also on a “first come, first serve” basis.
- 15          • Conversions commence after the August 1 application deadline and are scheduled  
16          throughout the remainder of the Program Year.
- 17          • The assigned Business Customer Representative and field personnel from the Company  
18          ensure that the LED conversion is successfully completed and provide support to the  
19          participating municipalities as needed.
- 20          • Once the LED conversion is complete, the Company updates the participating  
21          municipalities’ street light billing accounts with the new LED rates and Business  
22          Customer Representatives check with the customer during the next billing cycle that  
23          the LED rates have been appropriately reflected.

1 **Q. Please explain how the Company is proposing to modify its current LED street light**  
2 **program?**

3 A. The Company is proposing several modifications to its current LED street light program.

4 **1. Expand the number of LED fixture types offered in the Company's Tariff.**

5 In recent discussions with lighting vendors, the Company has learned that many  
6 vendors are either no longer offering HPS fixtures or are increasing the cost of these  
7 products to account for diminishing demand in the marketplace, and consequently,  
8 lower inventory levels of these assets. To account for the reduction in HPS fixture  
9 supply and increasing product costs, the Company believes it is prudent at this time to  
10 expand its offering of LED fixtures that can be used for both new installations and in  
11 the replacement of existing mercury vapor or HPS fixtures.

12 **2. The Company proposes to begin installing or converting up to 3,000 LED street**  
13 **lights per year beginning January 1, 2019.**

14 The Company acknowledges the benefits of LED versus HPS street lights  
15 communicated by municipalities participating in the LED Pilot Program over the last  
16 several years. This combined with a diminishing supply and increasing cost of HPS  
17 street light fixtures has prompted the Company to propose an enhanced LED street  
18 lighting installation and conversion program. Beginning January 1, 2019, the Company  
19 proposes to install up to 3,000 LED light annually, and retains the option to install  
20 additional LED lights at its discretion. The Company will take into consideration  
21 requests and input from municipalities when determining which existing street lights  
22 to convert and new LED street lights to install in a given year.



1 **Q. How is the Company proposing to recover LED street lighting costs?**

2 A. The Company is proposing a LED rate in its tariff. The details are provided in the  
3 testimony of Mr. Ogden (Statement No. 15).

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

5 A. Yes, it does.



**EPR** | ELECTRIC POWER  
RESEARCH INSTITUTE


# A U.S. CONSUMER'S GUIDE TO ELECTRIC VEHICLES

FEBRUARY 2018





# Today's Choices in Cars

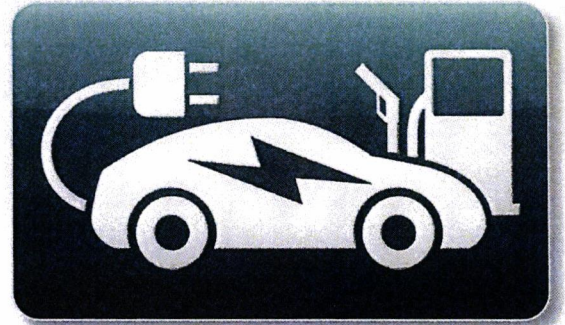


Electric cars offer consumers affordable, efficient, and high-tech transportation. More models, including crossovers, minivans, hatchbacks, and sedans, become available every year. Today, new-car buyers can choose from about 40 models. By 2022, about 90 electric vehicles are projected.

An expanding nationwide charging network enables more consumers to consider electric cars, although most drivers still prefer to charge at home due to convenience and savings over time. At the U.S. national average price of 12.5 cents per kilowatt-hour (kWh), electricity is roughly equivalent to gasoline at \$1 a gallon. Plus, many electricity providers offer special electric vehicle rates.

Displacing gasoline with domestic electricity cuts petroleum use and emissions, which benefits public health. Electrifying the transportation sector can reduce greenhouse gas emissions in 2050 by 57% relative to 2015 levels.

Take a look at your driving needs. An electric vehicle might work for you.



## ELECTRIC VEHICLES

Plug-in electric vehicles have batteries that recharge by plugging into the electricity grid. There are two main types. Plug-in hybrids are powered by an electric motor(s) and battery, paired with an internal combustion engine. Battery electric vehicles, also called all-electric vehicles, are powered by an electric motor and battery alone, and never use gasoline.

Plug-in hybrid designs differ. Most drive on electricity alone using battery energy, and after the battery is discharged, continue driving using gasoline much like conventional hybrids. (Conventional hybrids have a smaller battery and do not plug in.) On average, plug-in hybrids can travel 10 to 50 miles on electricity before they switch to gasoline. Their gas tanks extend total range to between 300 and 600 miles. Some designs allow the driver to choose when to use electricity or gasoline.

All-electric vehicles can travel farther on electricity than plug-in hybrids, but their total range is limited by the battery size. As battery technology advances and costs come down, vehicle range is increasing. Most battery electric vehicles available today promise 100 to 240 miles on a charge, and some can travel even farther. Most future models promise even more range, 200 to 300 miles.



## ELECTRIC VEHICLE AVAILABILITY

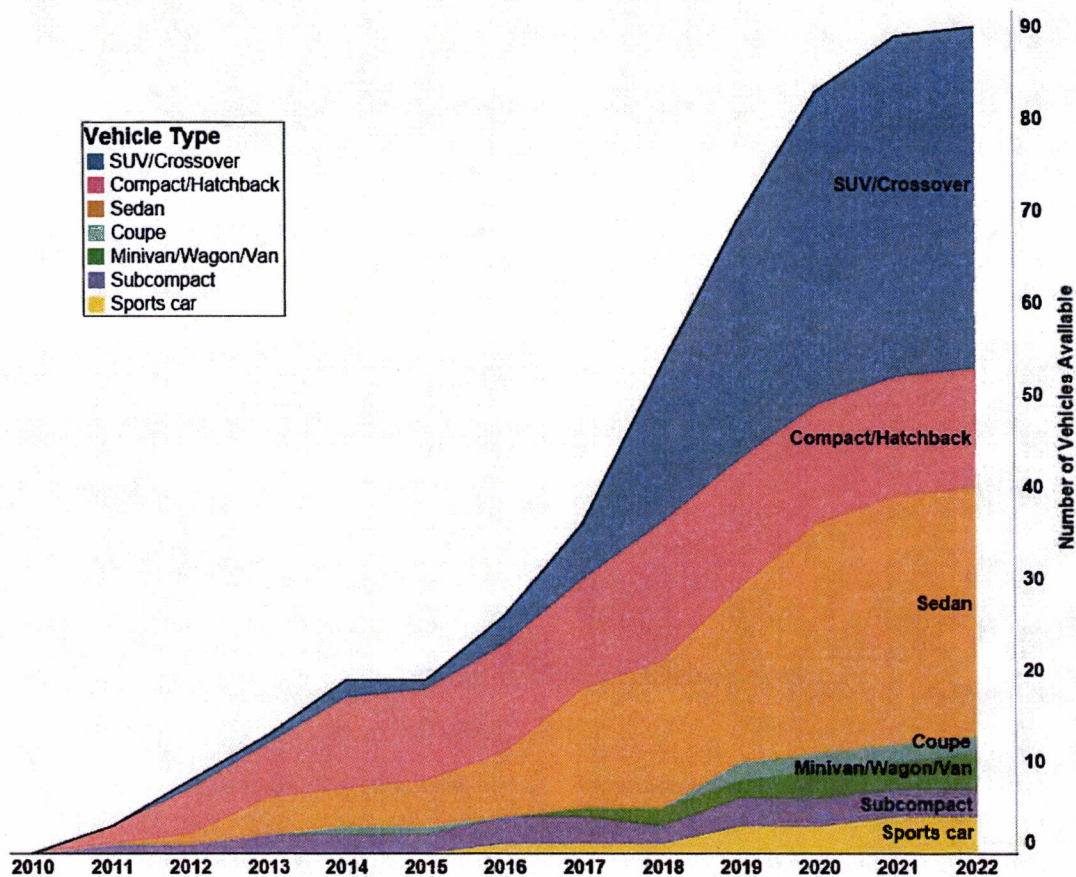
The modern electric vehicle market is evolving quickly. Today, you can buy an electric car in almost every vehicle class, as shown in Figure 1. Although electric cars account for roughly 1% of global new-car sales, they are a growing and increasingly competitive segment. Automakers are offering more choices in trim levels and body styles. Some even offer different powertrains—gasoline, battery electric, plug-in hybrid, or hydrogen fuel cell—for the same car.

Some electric vehicle models are available nationwide. Others are available only in California, the Pacific Northwest, and some Northeast states. Still others can be ordered through a dealer, even if that dealer does not have electric vehicles in stock.

Used electric cars are now available, as well. As people who bought the first generation of electric vehicles trade up to the newest models, their old cars are now for sale in the used-car market as affordable electric vehicle options.

In addition, several ultra-luxury models priced over \$150,000 are available. (They are listed in Table 1 on page 12 but not detailed in this guide.)

The following pages highlight new model-year electric cars that are available as of February 1, 2018.



The number and variety of electric vehicle models continues to grow. By the end of 2018, about 53 different models are expected to be available. By 2022, at least 90 models are projected.



# Available Nationwide

## 2018 BMW 330e iPerformance



*Photo courtesy of BMW*

**Type:** Plug-in hybrid; Sedan  
**EPA electric range:** 14 miles  
**EPA total range (gas + electric):** 350 miles  
**Charging time:** 2.2 hours @ 240V; 7 hours @120V

## 2018 BMW 530e iPerformance



*Photo courtesy of BMW*

**Type:** Plug-in hybrid; Sedan  
**EPA electric range:** 16 miles  
**EPA total range (gas + electric):** 370 miles  
**Charging time:** <3 hours @ 240V; 7 hours @120V

## 2018 BMW 740e xDrive iPerformance



*Photo courtesy of BMW*

**Type:** Plug-in hybrid; Sedan  
**EPA electric range:** 14 miles  
**EPA total range (gas + electric):** 340 miles  
**Charging time:** 3 hours @ 240V; 7 hours @120V

## 2018 BMW i3 REx and i3



*Photo courtesy of BMW*

**Type:** Plug-in hybrid (i3 REx); Battery electric vehicle (i3); Compact/Hatchback  
**EPA electric range:** 97 miles (i3 REx); 114 miles (i3)  
**EPA total range (gas + electric):** 180 miles (i3 REx)  
**Charging time:** 5 hours @ 240V; Fast-charging capable



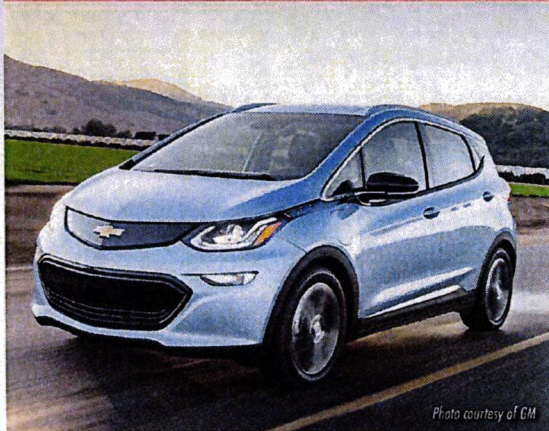
**2018 BMW X5 xDrive40e iPerformance**



*Photo courtesy of BMW*

**Type:** Plug-in hybrid; SUV/Crossover  
**EPA electric range:** 14 miles  
**EPA total range (gas + electric):** 540 miles  
**Charging time:** 3 hours @ 240V; 6 hours @ 120V

**2018 Chevrolet Bolt EV**



*Photo courtesy of GM*

**Type:** Battery electric vehicle; Compact/Hatchback  
**EPA electric range:** 238 miles  
**Charging time:** 9.3 hours @ 240V; Fast-charging capable

**2018 Chevrolet Volt**



*Photo courtesy of GM*

**Type:** Plug-in hybrid; Compact/Hatchback  
**EPA electric range:** 53 miles  
**EPA total range (gas + electric):** 420 miles  
**Charging time:** 4.5 hours @ 240V; 13 hours @ 120V

**2018 Chrysler Pacifica Hybrid**




*Photo courtesy of Chrysler*

**Type:** Plug-in hybrid; Minivan/Wagon/Van  
**EPA electric range:** 33 miles  
**EPA total range (gas + electric):** 570 miles  
**Charging time:** 2 hours @ 240V; 14 hours @ 120V





**2018 Ford Focus Electric**



*Photo courtesy of Ford*

**Type:** Battery electric vehicle; Compact/Hatchback  
**EPA electric range:** 115 miles  
**Charging time:** 5.5 hours @ 240V; Fast-charging capable

**2018 Ford Fusion Energi**



*Photo courtesy of Ford*

**Type:** Plug-in hybrid; Sedan  
**EPA electric range:** 21 miles  
**EPA total range (gas + electric):** 610 miles  
**Charging time:** 2.5 hours @ 240V; 7 hours @ 120V

**2018 Honda Clarity Plug-in Hybrid**



*Photo courtesy of Honda*

**Type:** Plug-in hybrid; Sedan  
**EPA electric range:** 48 miles  
**EPA total range (gas + electric):** 340 miles  
**Charging time:** 2.2 hours @ 240V; 16 to 24 hours @ 120V

**2018 Hyundai Ioniq Electric**



*Photo courtesy of Hyundai*

**Type:** Battery electric vehicle; Compact/Hatchback  
**EPA electric range:** 124 miles  
**Charging time:** 4 hours @ 240V; Fast-charging capable



**2018 Hyundai Ioniq Plug-in Hybrid**



*Photo courtesy of Hyundai*

**Type:** Plug-in hybrid; Compact/Hatchback  
**EPA electric range:** 29 miles  
**EPA total range (gas + electric):** 630 miles  
**Charging time:** 2.3 hours @ 240V; 10 to 14 hours @ 120V

**2017 Hyundai Sonata Plug-in Hybrid**



*Photo courtesy of Hyundai*

**Type:** Plug-in hybrid; Sedan  
**EPA electric range:** 27 miles  
**EPA total range (gas + electric):** 590 miles  
**Charging time:** 2.7 hours @ 240V; 9 hours @ 120V


**2018 Kia Niro Plug-in Hybrid**



*Photo courtesy of Kia*

**Type:** Plug-in hybrid; SUV/Crossover  
**EPA electric range:** 26 miles  
**EPA total range (gas + electric):** 560 miles  
**Charging time:** 2.5 hours @ 240V; <9 hours @ 120V

**2018 Kia Optima Plug-in Hybrid**



*Photo courtesy of Kia*

**Type:** Plug-in hybrid; Sedan  
**EPA electric range:** 29 miles  
**EPA total range (gas + electric):** 610 miles  
**Charging time:** 2.7 hours @ 240V; 9 hours @ 120V



**2018 MINI Cooper SL Countryman All4**



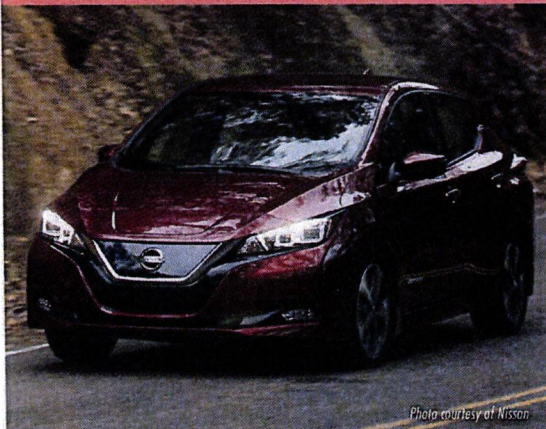
**Type:** Plug-in hybrid; SUV/Crossover  
**EPA electric range:** 12 miles  
**EPA total range (gas + electric):** 270 miles  
**Charging time:** 2 hours @ 240V; 4 to 6 hours @ 120V

**2018 Mitsubishi Outlander PHEV**



**Type:** Plug-in hybrid; SUV/Crossover  
**EPA electric range:** 22 miles  
**EPA total range (gas + electric):** 310 miles  
**Charging time:** 3.5 hours @ 240V; 8 hours @ 120V;  
Fast-charging capable

**2018 Nissan LEAF**



**Type:** Battery electric vehicle; Compact/Hatchback  
**EPA electric range:** 151 miles  
**Charging time:** 7.5 hours @ 240V; Fast-charging capable

**2017 Porsche Cayenne S E-Hybrid**



**Type:** Plug-in hybrid; SUV/Crossover  
**EPA electric range:** 14 miles  
**EPA total range (gas + electric):** 480 miles  
**Charging time:** 3 hours @ 240V; up to 11 hours @ 120V



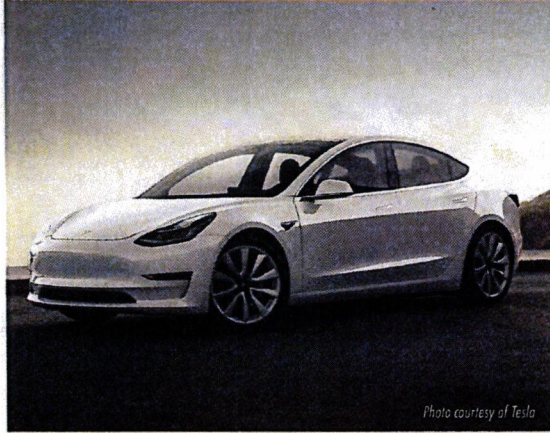
2018 smart fortwo Electric Drive



*Photo courtesy of Mercedes-Benz*

**Type:** Battery electric vehicle; Subcompact  
**EPA electric range:** 58 miles  
**Charging time:** 3 hours @ 240V; 16.5 @ 120V

Tesla Model 3



*Photo courtesy of Tesla*

**Type:** Battery electric vehicle; Sedan  
**EPA electric range:** 220 to 310 miles  
**Charging time:** 8.5 to 12 hours @ 240V; Fast-charging capable

Tesla Model S



*Photo courtesy of Tesla*

**Type:** Battery electric vehicle; Sedan  
**EPA electric range:** 335 miles  
**Charging time:** 4.75 to 8.75 hours @ 240V; Fast-charging capable

Tesla Model X




*Photo courtesy of Tesla*

**Type:** Battery electric vehicle; SUV/Crossover  
**EPA electric range:** 295 miles  
**Charging time:** 6.5 to 9.5 hours @ 240V; Fast-charging capable





**2018 Toyota Prius Prime**



*Photo courtesy of Toyota*

**Type:** Plug-in hybrid; Compact/Hatchback  
**EPA electric range:** 25 miles  
**EPA total range (gas + electric):** 640 miles  
**Charging time:** 2 hours @ 240V; 5.5 hours @ 120V

**2018 Volvo S90**



*Photo courtesy of Volvo*

**Type:** Plug-in hybrid; Sedan  
**EPA electric range:** 21 miles  
**EPA total range (gas + electric):** 410 miles  
**Charging time:** 3 hours @ 240V; 7 to 10 hours @ 120V

**2018 Volvo XC60**



*Photo courtesy of Volvo*

**Type:** Plug-in hybrid; SUV/Crossover  
**EPA electric range:** 18 miles  
**EPA total range (gas + electric):** 370 miles  
**Charging time:** 3 hours @ 240V; 6 to 9 hours @ 120V

**2018 Volvo XC90**



*Photo courtesy of Volvo*

**Type:** Plug-in hybrid; SUV/Crossover  
**EPA electric range:** 19 miles  
**EPA total range (gas + electric):** 380 miles  
**Charging time:** 3 hours @ 240V; 6 to 9 hours @ 120V



# Available in Select Markets

**2018 Audi A3 Sportback e-tron**



**Type:** Plug-in hybrid; Compact/Hatchback  
**EPA electric range:** 16 miles  
**EPA total range (gas + electric):** 400 miles  
**Charging time:** 2.25 hours @ 240V;  
8 hours @ 120V

**2018 Cadillac CT6 Plug-in**



**Type:** Plug-in hybrid; Sedan  
**EPA electric range:** 31 miles  
**EPA total range (gas + electric):** 430 miles  
**Charging time:** 4.5 hours @ 240V;  
10 to 15 hours @ 120V

**2017 Fiat 500e**



**Type:** Battery electric vehicle; Subcompact  
**EPA electric range:** 84 miles  
**Charging time:** 4 hours @ 240V

**2018 Honda Clarity Electric**



**Type:** Battery electric vehicle; Sedan  
**EPA electric range:** 89 miles  
**Charging time:** 3 hours @ 240V;  
Fast-charging capable

**2018 Kia Soul Electric**



**Type:** Battery electric vehicle;  
Compact/Hatchback  
**EPA electric range:** 111 miles  
**Charging time:** 5 hours @ 240V;  
Fast-charging capable

**2018 Mercedes-Benz C350e**



**Type:** Plug-in hybrid; Sedan  
**EPA electric range:** 9 miles  
**EPA total range (gas + electric):** 410 miles  
**Charging time:** 1.5 hours @ 240V;  
7.3 hours @ 120V

**2018 Mercedes-Benz GLE550e**



**Type:** Plug-in hybrid; SUV/Crossover  
**EPA electric range:** 10 miles  
**EPA total range (gas + electric):** 460 miles  
**Charging time:** 2 hours @ 240V;  
7.5 hours @ 120V

**2018 Volkswagen e-Golf**



**Type:** Battery electric vehicle;  
Compact/Hatchback  
**EPA electric range:** 125 miles  
**Charging time:** 5.3 hours @ 240V;  
Fast-charging capable



# Availability at a Glance

Table 1 – U.S. Electric Vehicle Availability

AVAILABLE NOW			EXPECTED IN 2018					
	MODEL NAME	RANGE (MI) <sup>1</sup>	WHERE		MODEL NAME	RANGE (MI) <sup>1</sup>	WHEN	
BATTERY ELECTRIC VEHICLE	<b>SUV/CROSSOVER</b>			<b>SUV/CROSSOVER</b>				
		Tesla Model X	295	Nationwide	2019 Audi e-tron Quattro	275	2018	
	<b>COMPACT/HATCHBACK</b>			<b>COMPACT/HATCHBACK</b>				
		BMW i3	114	Nationwide	BMW X7 iPerformance	TBA	2018	
		Chevrolet Bolt EV	238	Nationwide	2019 Hyundai Kona Electric	200	Late 2018	
		Ford Focus Electric	115	Nationwide	2019 Jaguar I-PACE	220	Mid 2018	
		Hyundai Ioniq Electric	124	Nationwide	2019 Kia Niro Electric	200+	Late 2018	
		Nissan LEAF	151	Nationwide	<b>COMPACT/HATCHBACK</b>			
		Kia Soul Electric	111	Select Markets	2019 Nissan LEAF (Gen. 2+)	225	Late 2018	
		Volkswagen e-Golf	125	Select Markets	Hyundai Ioniq Electric (Gen 1+)	200	2018	
	<b>SEDAN</b>							
		Tesla Model 3	220-310	Nationwide				
		Tesla Model S	335	Nationwide				
		Honda Clarity Electric	89	Select Markets				
	<b>SUBCOMPACT</b>							
		smart fortwo Electric Drive	58	Nationwide				
	Fiat 500e	84	Select Markets					
PLUG-IN HYBRID	<b>SUV/CROSSOVER</b>			<b>SUV/CROSSOVER</b>				
		BMW X5 xDrive40e iPerformance	14/540	Nationwide	Audi Q8 e-tron	37/620	2018	
		Kia Niro Plug-in Hybrid	26/560	Nationwide	Bentley Bentayga	14/TBA	2018	
		MINI Cooper SE Countryman	12/270	Nationwide	Mercedes-Benz GLC350e	TBA/TBA	Summer 2018	
		Mitsubishi Outlander PHEV	22/310	Nationwide	Subaru	TBA/TBA	2018	
		Porsche Cayenne S E-Hybrid	14/480	Nationwide	<b>SEDAN</b>			
		Volvo XC60	18/370	Nationwide	Porsche Panamera E-Hybrid	22/TBA	Spring 2018	
		Volvo XC90	19/380	Nationwide	<b>MINIVAN/WAGON/VAN</b>			
		Mercedes-Benz GLS550e	10/460	Select Markets	Porsche Panamera E-Hybrid Sport Turismo	22/TBA	Spring 2018	
	<b>COMPACT/HATCHBACK</b>			<b>SPORTS CAR</b>				
		BMW i3 REx	97/180	Nationwide	BMW i8 Roadster	18/330	2018	
		Chevrolet Volt	53/420	Nationwide				
		Hyundai Ioniq Plug-in Hybrid	29/630	Nationwide				
		Toyota Prius Prime	25/640	Nationwide				
		Audi A3 Sportback e-tron	16/400	Select Markets				
	<b>SEDAN</b>							
		BMW 330e iPerformance	14/350	Nationwide				
		BMW 530e iPerformance	16/370	Nationwide				
		BMW 740e xDrive iPerformance	14/340	Nationwide				
		Ford Fusion Energi	21/610	Nationwide				
		Honda Clarity Plug-in Hybrid	48/340	Nationwide				
		Hyundai Sonata Plug-in Hybrid	27/590	Nationwide				
		Karma Revero	37/240	Nationwide				
		Kia Optima Plug-in Hybrid	29/610	Nationwide				
		Volvo S90	21/410	Nationwide				
		Cadillac CT6 Plug-in	31/430	Select Markets				
	Mercedes-Benz C350e	9/410	Select Markets					
<b>MINIVAN/WAGON/VAN</b>								
	Chrysler Pacifica Hybrid	33/570	Nationwide					
<b>SPORTS CAR</b>								
	BMW i8	15/330	Nationwide					

<sup>1</sup> Range: For battery electric vehicles is all-electric range. For plug-in hybrids is all-electric/combined (electric + gas) range. Sources for vehicles available now: [www.fueleconomy.gov](http://www.fueleconomy.gov) and manufacturer websites. Sources for vehicles expected in 2018: manufacturer and industry news websites, data subject to change.



# Future Electric Vehicles

In 2017 and early 2018, carmakers made international headlines with strong, forward-looking statements about their electric vehicle development and deployment plans. Consultants and market analysts also made wide-ranging and sometimes very optimistic predictions about the electric vehicle market in 10 to 20 years.

Clearly, the automotive industry is going through a major transformation, and it appears electrification will play a significant role. Table 2 provides a summary of the major automakers' recent statements on electrification.

**Table 2 – Automaker Statements on Future Vehicles and Electrification**

Automaker	Number of Electrified <sup>1</sup> Vehicles	Number of All-Electric Vehicles	Year Promised
Audi	20	10	2025
BMW	25	12	2025
Fiat Chrysler	One-half of vehicle lineup	Not specified	2022
Ford	40	16	2022
General Motors	20	Not specified	2023
Honda	Two-thirds of vehicle lineup	Not specified	2030
Jaguar Land Rover	One-half of vehicle lineup	Not specified	2020
Mercedes-Benz	Electrified equivalent of all new vehicles	Not specified	2022
Nissan/Mitsubishi/Renault	Electrified equivalent of all new vehicles	Not specified	2022
Porsche	One-half of global sales volume is plug-in vehicles	Not specified	2025
Toyota (and Lexus)	Electrified equivalent of all new vehicles	Not specified	2025
Volkswagen Group	All models electrified	15	2025
Volvo	Electrified equivalent of all new vehicles	Not specified	2019

<sup>1</sup> The term, "electrified" may mean conventional hybrid, not plug-in electric. Expanded use of electric drive systems helps reduce costs and build the broader market for electric vehicles.





# Answers to Important Questions

## How far do electric vehicles go on a charge?

Plug-in hybrids typically drive from about 10 to 50 miles on electricity alone, before the gasoline engine takes over. On electricity and gas combined, total range is 300 to 600 miles. If you charge every day, you may be able to drive 1,000 to 2,000 miles between gasoline fill-ups.

Battery electric vehicle range is increasing each year, with many current models traveling 100 to 240 miles on a charge, and a few capable of going much farther.

As with gasoline fuel economy, your driving behavior affects electric vehicle range. Many people find their electric car's range exceeds their daily driving needs and they need not charge every day.

## How much does it cost to charge?

At the U.S. national average residential price of 12.5 cents per kilowatt-hour (kWh), fueling a car with electricity is roughly equivalent to buying gasoline at \$1 a gallon.

## How do I charge my car?

Most drivers find it convenient and cost-effective to charge at home. Every electric car comes with a 120V charging cord that plugs into a standard household outlet. Charging at 120V delivers roughly two to three miles of range for every hour of charging, which is usually sufficient for plug-in hybrids. Charging at 120V may also be sufficient for some all-electric cars, depending on the car's range and the driver's daily needs.

For faster charging, you can install a 240V charging station at home. Many electricity providers offer discounted electric vehicle rates that encourage charging overnight when electricity is plentiful.

Public and workplace charging availability is increasing nationwide, and fast-charging station networks are also expanding. A fast charger can charge a properly equipped battery electric vehicle to 80% full in about 30 to 40 minutes.

For more information, see EPRI publication, "A U.S. Consumer's Guide to Electric Vehicle Charging" (Product ID [3002009442](#)).

## Can weather affect my car's performance?

Electric vehicles may draw energy from the traction battery for interior air-conditioning, heating, and window defrosting or defogging. This energy use can reduce driving range. To minimize the effects, you can program the car to pre-condition the interior and battery while it is plugged in. Pre-conditioning also makes a car more immediately comfortable for passengers. Windshield wipers, headlights, and similar accessories do not affect range.

## Where can I get an electric vehicle?

Some electric vehicle models are available nationwide. Others are available only in California, the Pacific Northwest, and some Northeast states. Still others can be ordered through a local dealer, even if that dealer does not stock electric vehicles on the lot.

Used electric cars are now available, as well. As people who bought the first generation of electric vehicles trade up to the newest models, the used-car market offers affordable electric options for consumers.

## What incentives are available?

A federal tax credit of up to \$7,500 may be available for qualified electric vehicles. Some state and local governments offer vehicle and charging station incentives. In some metros, electric vehicles can use carpool lanes with a single driver. Parking and charging perks are available in some cities. Some electricity providers offer rebates and incentives for electric vehicle charging. Incentives are subject to limitations and may change over time. More information is available at the [U.S. Dept. of Energy Office of Energy Efficiency and Renewable Energy](#).





### What should I consider in making a purchase?

**Consider your driving needs and lifestyle.** If you have only one car, or often drive long distances, a plug-in hybrid with its back-up internal combustion engine can provide a worry-free transition to electric vehicles. If you can charge at work you can effectively double your range.

If you have a predictable commute and a second car for long trips, or if you like the idea of a gasoline-free driving experience, a battery electric vehicle could be a good choice. Access to workplace or public charging may alleviate any range concerns.

**Consider costs and benefits.** With manufacturer lease options, discounted electricity rates, and government purchase incentives, electric vehicles can be less expensive to operate over their lifetime despite costing more to purchase.

**Consider environmental benefits.** Electric vehicles have lower emissions than gasoline-powered vehicles, even in areas where much of the electricity is generated by power plants that use fossil fuels. For more information, read EPRI publication, "Environmental Assessment of a Full Electric Transportation Portfolio" (Product ID [3002006881](#)).

### FOR MORE INFORMATION

Explore automakers' websites for product updates and check your local electric utility website for information about electric vehicles. Other sources:

#### Electric Drive Transportation Association

[www.electricdrive.org](http://www.electricdrive.org) and

[www.goelectricdrive.org](http://www.goelectricdrive.org)

#### U.S. Dept. of Energy Alternative Fuels Data Center

[www.afdc.energy.gov/fuels/electricity.html](http://www.afdc.energy.gov/fuels/electricity.html)

#### U.S. Dept. of Energy Fuel Economy Information

<http://www.fueleconomy.gov/>

#### Plug In America

[www.pluginamerica.org](http://www.pluginamerica.org)

For more information about EPRI Electric Transportation research activities contact:

**Dan Bowermaster**, Program Manager

Electric Transportation  
[dbowermaster@epri.com](mailto:dbowermaster@epri.com)



**The Electric Power Research Institute, Inc.**

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Executive Order City of Pittsburgh Office of the Mayor	
Subject: Reinforcing Pittsburgh's Commitment to the Global Partnership on Climate Change	Number: 2017-08
By Direction of:  William Peduto, Mayor	Date: June 2, 2017

WHEREAS, climate change is a worldwide problem recognized by government, business and academic leaders;

And WHEREAS, protecting our planet is of utmost importance to our children and grandchildren, who are at threat of living in a world with dangerous increases in temperature, coastal destruction and violent weather events;

And WHEREAS, 195 countries, including the United States, vowed to address climate change in agreements reached in Paris in December 2015 (the "Paris Agreement");

And WHEREAS, the Mayor represented the City of Pittsburgh in Paris as part of a global coalition of mayors who recognize the catalyzing potential of urban areas to significantly curb emissions;

And WHEREAS, a more sustainable future will increase our economic competitiveness as a region, not detract from it;

And WHEREAS, the City of Pittsburgh paid a heavy price for our history of heavy industry, including remediating decades of pollution to our neighborhoods and hillsides and overcoming a collapse of our local economy;

And WHEREAS, the City of Pittsburgh has been a shining example of what the Paris Agreement could mean for governments seeking to revitalize their environment and promote and strengthen their economy;

And WHEREAS, the City of Pittsburgh has long been at the forefront of local government and individual citizen activism to protect our environment, from the nation's first local Clean Air legislation passed by Mayor David Lawrence in 1949 to the worldwide environmental advocacy of Rachel Carson,

And WHEREAS, the City of Pittsburgh has been building upon our decades of commitment to climate change, continuing with our adoption of the Pittsburgh Climate Action Plan in 2008 which is now undergoing its third update (the "Climate Action Plan"),

And WHEREAS, the City of Pittsburgh actively participates in the 100 Resilient Cities program, attempting to make our residents ready for the environmental, social, and economic disruptions of the future;

And WHEREAS, the City of Pittsburgh has created and adopted a P4 framework which establishes the benefit for people, the shared responsibility for the place we call home, the stewardship of our common planet and the need to measure performance as way to advance improvement;

And WHEREAS, President Donald Trump's unfortunate action yesterday of seeking to withdraw these United States of America from the Paris Agreement, constitutes a serious dereliction of our moral duty to the planet, threatens the legacy of a sustainable environment for our children, weakens our nation's global and economic leadership at a crucial time in our history, and leaves it to mayors, in a global partnership of cities, to take immediate and permanent action;

NOW, THEREFORE, I, William Peduto, Mayor of the City of Pittsburgh, by the virtue of the authority vested in me by the City Charter and laws of the City of Pittsburgh do hereby direct the following actions.

1. The City of Pittsburgh hereby endorses and remains fully committed to the principles of the Paris Agreement.
  - a. As a member of the Mayor's National Climate Action Agenda (NNCAA), we join with 81 other cities and 39 million Americans in reaffirming our commitment to the goals enshrined in the Paris Agreement.
  - b. Working with the other members of NNCAA, the Chief Resiliency Officer of the City is empowered to undertake additional actions to meet the 1.5 degrees Celsius target.
2. The City of Pittsburgh hereby endorses and remains fully committed to our Climate Action Plan and our 2023 target of Greenhouse Gas reduction.
3. The City of Pittsburgh hereby endorses and remains fully committed to the Global Compact of Mayors, including the reduction of Greenhouse Gases 20% below 2003 levels in the City.
4. The City of Pittsburgh hereby endorses and remains fully committed to our 2030 objectives, as announced during the Paris summit:
  - Achieving 100 Percent Renewable Electricity Consumption for Municipal Operations
  - A City Wide Zero Waste Initiative to divert 100 Percent of Materials from Land Fill
  - Fifty percent energy consumption reduction city wide
  - Development of a Fossil Fuel Free Fleet
  - Divestment of the City's Pension Assets from Fossil Based Companies
  - Fifty percent water consumption citywide
  - Fifty percent transportation emissions reduction city wide
5. The City of Pittsburgh hereby endorses and remains fully committed to quantifying the impact of the City's work in reducing Greenhouse Gas Emissions and building a more sustainable City.
  - a. Through the completion of the Pittsburgh Climate Action Plan 3.0, the Chief Resiliency Officer shall coordinate and document the impacts of GHG reduction and air quality improvement effects of the initiatives already happening across the City of Pittsburgh's departments and associated authorities, including but not limited to:
    - The advancement of Carbon Neutrality objectives within the City
    - Implementation of Building Energy Benchmarking and Transparency
    - Identification, Development and Procurement of Local Renewable Power
    - Adoption of industry leading energy efficiency standards for buildings
    - Electrification of transportation systems in conjunction with renewable energy sources

- Implementation of the Pittsburgh Green First – Green Infrastructure Plan
- Support for the weatherization and maintenance of Pittsburgh housing stock to help our elderly and vulnerable populations
- Collaboration with local utility partners to reduce product loss and enhance delivery of service for customers and build resilience in energy networks
- Protection and regeneration of our natural environment through land conservation, park preservation and urban agriculture
- Support for transit oriented development and location efficiency to encourage modal choices for all people
- Partnership with private and institutional building owners to reduce peak loads and manage energy resources efficiently
- Transition of the City of large-scale fleet operations to electric or other renewable power resources.
- Encouragement of adoption of electric vehicle technologies by citizens
- Reduction in the City's consumption of materials, development of opportunities to foster new economies through the reuse of materials and the recycling and repurposing of materials to new uses.

All City departments and authorities under the Mayor's jurisdiction shall work cooperatively to ensure the success of the missions outlined above. Independent agencies, City-affiliated entities, and City-related institutions are also strongly encouraged to work to help advance these efforts and adopt similar initiatives, where applicable. All actions and outcomes shall be in accordance with applicable local, state, and federal laws.

This Executive Order shall take effect immediately and remain in effect until amended or rescinded in writing by the Mayor.

# Driver's Checklist: A Quick Guide to Fast Charging



The auto industry is getting electrified. Electric vehicle (EV) production has grown 10X over the past four years and EV sales will grow 14X over the next ten years. As EV adoption grows, so does the number of charging stations. There are thousands of EV charging stations across the U.S. that offer different types of charging at different speeds, so EV drivers can stay charged up anywhere they go.

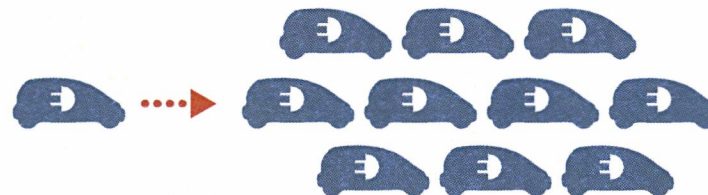
The details of EV charging might seem a bit complicated. But there's good news: you don't need to know much about electricity to charge an EV. It's like how you don't need to know all the differences between regular, plus and premium gas to fuel a combustion engine—you only need to know what type of gas the car takes. It's pretty much that simple for EVs, too.

Here's a quick overview of how the different types of EV charging work, so you can plug in with confidence the next time you need to.

## EV Sales Are Exploding

EV sales grew 10X over the past four years.

They are expected to grow 14X in the next 10 years.





## How Does EV Charging Work?

You most likely charge your cell phone or computer often, even if you don't know a lot about electricity. You just plug in the device and go about your day.

EV charging is similar. It connects the battery in your car with a power source that can charge it. There's a lot going on behind the scenes, but as an EV driver, you don't have to worry about it.

Most power outlets use AC, or alternating current. Batteries typically use DC, or direct current, to charge. This means that part of the charging process involves converting AC to DC.

There are three main types of EV charging: Level 1, Level 2, and DC fast. Levels 1 and 2 convert AC to DC using an on-board converter in the EV. Each vehicle's on-board converter has specific limits on how fast it can charge.

With DC fast charging, the conversion from AC to DC happens in the charging station, not in the EV. This allows stations to supply more power, charging vehicles faster.

## How Long Does it Take to Charge an EV?

Typical time to fill up an 80-mile battery by charging type



\* DC fast charging can get many EV batteries charged to 80 percent in 20-30 minutes

## Types of Charging

### Level 1

"Level 1" charging is just plugging in to a standard electrical outlet. Level 1 charging can be convenient for home use, but charges very slowly, offering about 5 miles of Range Per Hour (RPH). Level 1 is most useful when a vehicle will be parked for several hours.

### Level 2

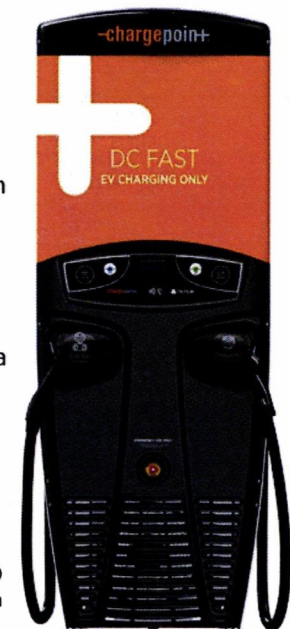
Some home chargers and most public charging stations are "Level 2." These stations can add 12 to 25 RPH, depending on the type of EV and its on-board charger. Level 2 charging stations are ideal for times when you'll be parked for at least an hour, such as at work, restaurants, movie theaters, sporting events or longer shopping trips. Level 2 charging will generally give you enough juice to get around town, and works up to six times faster than Level 1 charging.

### DC Fast

On long trips or when you're pressed for time, you'll probably want a faster charge to get where you're going. DC fast charging can deliver 100 RPH or more, charging some EVs to 80 percent in 20-30 minutes.






DC fast charging stations have various power levels. In general, higher power levels charge EVs faster. Check each DC fast charging station to find its power level. Charging speed may also depend on the type of charging port your EV has.

Note that not all plug-in cars on the road today have a DC fast charging port. Most plug-in hybrids can only charge at Level 1 or 2.



ChargePoint Express 200  
50 kW DC Fast Charging Station

## EV Charging Basics

Type	Miles of Range Per Hour of Charging (RPH)	Time to Fully Charge	When to Use	Connector
Level 1, Standard Wall Outlet (AC)	5 RPH	+ 16 hours for an 80-mile battery + 40 hours for a 200-mile battery	+ Get some charge while you sleep Note: slower for cars with large batteries	 Note: you'll need your own cable to plug in to the wall for Level 1
Level 2 Charging Station (AC)	+ 12 RPH for cars with 3.7 kW on-board charger + 25 RPH for cars with 6.6 kW on-board charger	+ 3.5 hours for an 80-mile battery + 8 hours for a 200-mile battery	+ At work + While you sleep + Topping up around town	 J1772 connector
DC Fast Charging	100 RPH or more, depending on the power level of the charger  + 24 kW (up to 100 RPH) + 44 to 50 kW (up to 200 RPH)	Depends on the power level of the charger and car model, but could be 80% charged within 30 minutes	+ Short stops + Express Corridor locations	 SAE Combo (CCS)  CHAdeMO  Tesla

### Connectors

All EVs except Tesla use the same J1772™ connector for Level 2 charging. Tesla makes adapters that allow their vehicles to charge using J1772 or CHAdeMO connectors.

Not all EVs come with DC fast charging as a standard feature. It's often available as an upgrade package.

When choosing a DC fast charging station, check the connector to make sure it fits your car's charging port. There are three different DC fast charging connector standards in North America, each used by different EVs.

#### SAE Combo (CCS) is compatible with

- + BMW
- + VW
- + Chevy
- + All upcoming U.S. and European cars
- + Some of the new cars from Asian manufacturers



#### CHAdeMO is compatible with

- + Nissan
- + Mitsubishi
- + Kia



#### Tesla is compatible with

- + Tesla
- Note: adapters available for J1772 and CHAdeMO





## How Fast Can I Charge?

Many factors affect charging speed. At a basic level, more power means a faster charge. The type of charger (Level 1, 2 or DC fast) matters, too.

In general, larger EV batteries take more time to charge, and EVs with higher-powered on-board chargers charge faster. Batteries also start to charge more slowly as they become more full. As an EV owner, you will learn over time how fast your car charges at different types of stations.

The charging speed you can get at a DC fast station depends on the station's power level, the EV's battery capacity and real-time updates from the vehicle to the charger. DC fast chargers can send a lot of power to an EV, but the vehicle will control how much power it takes in and slow down the rate of charge as the battery fills and heats up. Some vehicles with smaller battery packs can only take in maximum power for a short time before the charging speed slows.

DC fast chargers can charge at varying RPH. Check the power level on a DC fast charging station to understand how fast you should be able to charge. After a few DC fast charges, you'll have a better idea of how quickly your EV charges at different power levels.

## Take Charging to the Next Level

Now that you know about all the charging options out there, are you ready for an EV (or a new EV with DC fast capability)? Check out some reasons to go electric here: [chargepoint.com/happier](http://chargepoint.com/happier)

Find DC fast charging locations in the ChargePoint mobile app: [chargepoint.com/mobile](http://chargepoint.com/mobile)



Download the free ChargePoint mobile app

## More on ChargePoint Express Charging

ChargePoint knows that EV drivers want to go farther. Our ChargePoint Express charging stations make it easy to get charged fast, and get to more places.

### Why Express?

Most of the time, EV drivers can just add a little bit of energy every time they park, using Level 1 or Level 2 charging. But for longer trips or when time is in short supply, EV drivers need another option. That's where DC fast charging comes in.

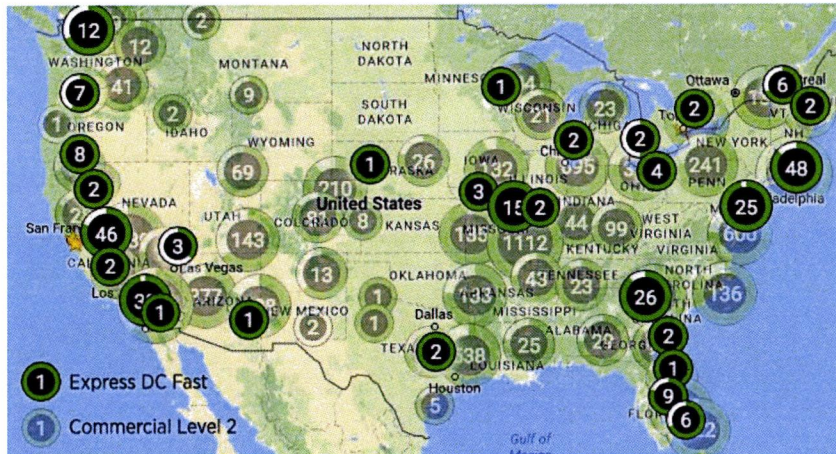
DC fast charging stations make it easy for EV drivers to get a lot of charge in not much time. Locating DC fast charging stations along major highways or at popular destinations makes it easy for EV drivers to pull off the road, charge up quickly and continue to their destination.



ChargePoint Express stations around the country make it possible for EV drivers to take road trips, without using any gas. Taking an all-electric road trip is now easier than ever.

## Where Can I Fast Charge?

There are more than 350 DC fast charging spots on the ChargePoint network, and that number continues to grow. Many DC fast charging stations are located within a mile of major roads and close enough to one another to eliminate range anxiety.



More than 350 DC fast charging spots on the ChargePoint network, with more than 30,000 spots total (September 2016)

You can always find nearby charging stations on the ChargePoint mobile app and driver portal. In the app, you can filter for a particular DC fast connector type to make it really easy to find the type of charging station you need. Or, enter the kind of EV you drive and the app will recommend the right stations.

## When Should I Use DC Fast?

DC fast doesn't replace Level 2 charging, it just provides a quicker charging option for longer trips. Level 2 charging is still the best choice for everyday charging and anytime you'll be parked for several hours, like overnight. You can always find both station types in the ChargePoint app.

## How Do I Charge?

1. Download the ChargePoint mobile app and create an account
2. Activate your ChargePoint card
3. Find nearby stations
4. Unlock a ChargePoint charging station with your ChargePoint card or the mobile app
5. Plug in
6. Track charging status on the mobile app



## Learn More

Learn more about ChargePoint Express charging:

- + [chargepoint.com/products/commercial/cpe100](http://chargepoint.com/products/commercial/cpe100)
- + [chargepoint.com/products/commercial/cpe200](http://chargepoint.com/products/commercial/cpe200)
- + [chargepoint.com/drivers/express](http://chargepoint.com/drivers/express)

About ChargePoint:

Visit [chargepoint.com/about](http://chargepoint.com/about), call 1.408.841.4500, or email [info@chargepoint.com](mailto:info@chargepoint.com)

Interested in stations? Call 1.877.370.3802 (U.S. toll free) or email [sales@chargepoint.com](mailto:sales@chargepoint.com).

For media requests, email [media@chargepoint.com](mailto:media@chargepoint.com).



**BEFORE THE  
PENNSYLVANIA PUBLIC UTILITY COMMISSION**

**Docket No. R-2018-3000124**

**Duquesne Light Company**

**DLC Statement No. 7**

**DIRECT TESTIMONY OF KATHERINE SCHOLL**

**Dated: March 28, 2018**



1 **Q. Please state your full name and business address.**

2 A. My name is Katherine Scholl. My business address is 411 Seventh Avenue, Mail Drop  
3 15-1, Pittsburgh PA 15219.

4 **Q. What is your position at Duquesne Light Company (“Duquesne Light” or  
5 “Company”)?**

6 A. I am the Director of Customer Experience.

7 **Q. How long have you worked at Duquesne Light?**

8 A. I have been with Duquesne Light since May 2016.

9 **Q. What are your current responsibilities?**

10 A. I oversee three areas within the Company’s Customer Service department: 1) Energy  
11 Efficiency / Act 129 Programs; 2) Universal Services; and 3) Customer Experience,  
12 which includes the design and implementation of strategies to improve customer  
13 satisfaction, respond more effectively to customer needs and preferences, and make  
14 interactions with customers through various channels as seamless and efficient as  
15 possible.

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

17 A. I attended Duquesne University, where I graduated Magna Cum Laude with a Bachelor  
18 of Science in Business Administration and also completed my Masters in Business  
19 Administration with High Honors. Prior to joining Duquesne Light in 2016, I spent  
20 nearly ten years at Giant Eagle Inc. in Pittsburgh, where my responsibilities included  
21 directing various aspects of customer relationship management (CRM), including the  
22 design and administration of loyalty programs, targeted marketing, and customer data  
23 analytics. I was also responsible for the company’s Payment Acceptance Strategy, which

1 involved optimizing relationships with payment systems providers to balance the cost of  
2 meeting customers' preferences for using various forms of tender with the cost of  
3 payment acceptance. Notably, I worked in a consortium with other retailers to introduce  
4 a mobile wallet aimed at making retail payments more convenient for the customer and  
5 less expensive for the participating companies.

6

7 Prior to joining Giant Eagle, I spent seven years at Acxiom Corporation providing  
8 customer acquisition and relationship management consulting services to top credit card  
9 issuers in the United States and the United Kingdom.

10

11 Prior to joining Acxiom Corporation, I spent 6 years in various roles in Consumer  
12 Lending and Credit Card management at Mellon Bank.

13 **Q. What is the purpose of your direct testimony?**

14 A. The purpose of my testimony is to discuss the Company's historical customer service  
15 performance and to describe new initiatives designed to further enhance Duquesne Light  
16 customers' experience. Additionally, I will briefly explain proposed changes to Rider  
17 No. 5 – Universal Service Charge (“USC”) designed to align with the Company's 2017-  
18 2019 Universal Service and Energy Conservation Plan (“2017-2019 USECP”) approved  
19 by the Pennsylvania Public Utility Commission (“Commission” or “PUC”) by Order  
20 entered March 23, 2017 at docket number M-2016-2534323.

21

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

2 A. Yes. I am sponsoring the following exhibits:

DLC Exhibit KMS-1 Customer Service Performance Metrics

DLC Exhibit KMS-2 Pennsylvania PUC, Bureau of Consumer Services, Quarterly Update to UCARE Report, January – December 2017

DLC Exhibit KMS-3 J.D. Power 2017 Residential and Business Customer Satisfaction Study results

DLC Exhibit KMS-4 2017 Research America survey results

DLC Exhibit KMS-5 Sample verbatim customer survey responses regarding transaction fees

3

4 **I. CUSTOMER SERVICE PERFORMANCE**

5 **Q. Please explain the metrics used to measure the Company's customer service**  
6 **performance.**

7 A. At Duquesne Light, we measure customer service performance in several ways. The  
8 Company monitors, tracks and reports on those customer service performance metrics  
9 required by 52 Pa. Code § 54.153(b). Among other metrics, the Company monitors,  
10 tracks and reports:

11 54.153(b)(1) Telephone Access:

- 12 • Percent of calls answered within 30 seconds;
- 13 • Average busy-out rate; and
- 14 • Call abandonment rate.

15



1                    54.143(b)(2) Billing:

- 2                    • Number and percent of residential bills not rendered once every billing
- 3                    period; and
- 4                    • Number and percent of small business bills not rendered once every
- 5                    billing period.

6                    54.143(b)(3) Meter Reading:

- 7                    • The number and percent of residential meters for which the company has
- 8                    failed to obtain an actual or ratepayer supplied reading within the past 6
- 9                    months to verify the accuracy of estimated readings in accordance with §
- 10                   56.12(4)(ii);
- 11                   • The number and percent of residential meters for which the company has
- 12                   failed to obtain an actual meter reading within the past 12 months to verify
- 13                   the accuracy of the readings, either estimated or ratepayer read in
- 14                   accordance with § 56.12(4)(iii); and
- 15                   • The number and percent of residential remote meters for which it has
- 16                   failed to obtain an actual meter reading under the time frame in
- 17                   § 56.12(5)(ii).

18                   54.153(b)(4) Response to Disputes :

- 19                   • The actual number of disputes for which the company did not provide a
- 20                   response to the complaining party within 30 days.

21

1 **Q. How has the Company performed with respect to those metrics?**

2 A. The Company's performance with respect to those metrics is included as DLC Exhibit  
3 KMS-1.

4 **Q. How else does the Commission benchmark the Company's customer service  
5 performance versus other electric utilities?**

6 A. The Commission's Bureau of Consumer Services ("BCS") releases a quarterly UCARE  
7 Report that measures major Pennsylvania utilities' customer service performance across  
8 several metrics. The BCS's most recent UCARE Report, which covers calendar year  
9 2017, is attached as DLC Exhibit KMS-2.

10 **Q. How does the Company compare to other utilities in the UCARE Report?**

11 A. The Company is a top performer. The UCARE Report ranks the Company first among  
12 Pennsylvania EDCs in shortest response time to both residential customer complaints and  
13 requests for payment arrangements, and second for fewest justified complaints.

14 **Q. Has the Company performed any surveys related to customer satisfaction?**

15 A. Yes. As required by 52 Pa. Code § 54.154, the Company works with Research America  
16 (formerly Metrix Matrix) to conduct transaction surveys of customers who have had  
17 interactions with the Company. Research American benchmarks results across  
18 Pennsylvania's EDCs.

19 **Q. How has the Company performed with relation to these surveys?**

20 A. The Research America report for 2017 is included as DLC Exhibit KMS-3. Duquesne  
21 Light ranks 4th out of 8 Pennsylvania utilities with 86% of customers surveyed rating  
22 their satisfaction with Duquesne Light 7 or higher on a scale of 1-10.

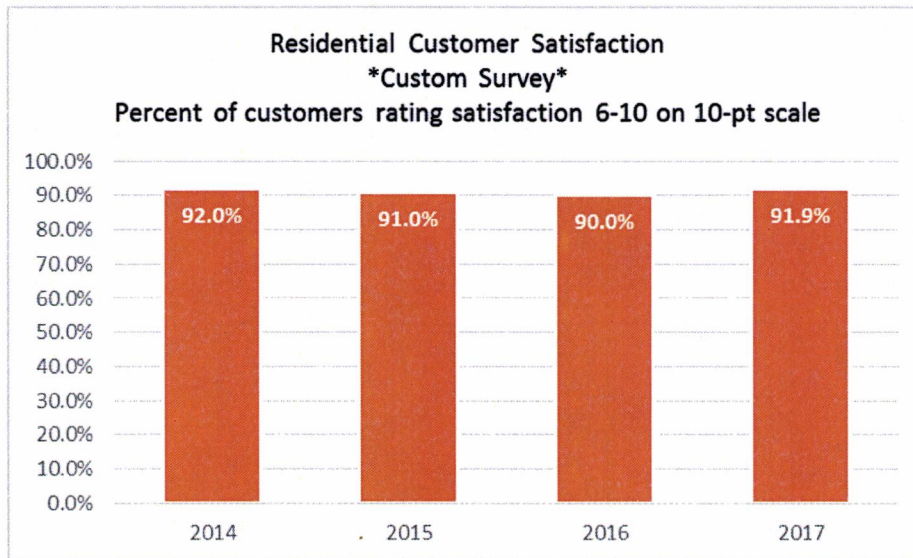
1 **Q. Are there any other surveys that the Company conducts to assess customer**  
2 **satisfaction?**

3 A. Yes. The Company contracts with Schmidt Market Research to conduct monthly custom  
4 surveys via the phone and web. The surveys measure overall satisfaction with Duquesne  
5 Light and probe on areas that are likely to influence customer satisfaction such as power  
6 quality and reliability, company reputation, energy efficiency, corporate citizenship,  
7 billing and payment, and vegetation management.

8 **Q. Please summarize the results of these surveys.**

9 A. The Company saw slight decreases in satisfaction in 2015 and 2016. By 2017,  
10 satisfaction returned to pre-2015 levels. See Chart 1 below.

11 *Chart 1:*



12

13

14 **Q. Does the Company benchmark its customer satisfaction performance versus other**  
15 **electric utilities?**

16 A. Yes. The Company benchmarks its performance using the J.D. Power Residential and  
17 Business Electric Utility Customer Satisfaction surveys.

1 **Q. How has the Company performed in these benchmarking studies?**

2 A. J.D. Power benchmarks residential customer satisfaction for a fiscal year that runs from  
3 July through June. Fiscal year 2017 ended June 30, 2017 with Duquesne Light scoring  
4 711 versus its peer group (East Large) score of 704. See DLC Exhibit KMS-3 for  
5 additional details.

6 Business customer satisfaction is measured on a calendar year basis. For the full-year  
7 2017, Duquesne ranked number one in its peer group (East Mid-size) and number two in  
8 the country. See DLC Exhibit KMS-4 for additional details.

9 **Q. Are there any other metrics the Company uses to measure customer service?**

10 A. Yes, we also track service reliability as measured by SAIDI, SAIFI, and CAIDI. Mr.  
11 Morris provides an overview of the Company's reliability performance in his direct  
12 testimony, Statement No. 4.

## 13 **II. ENHANCING CUSTOMER EXPERIENCE**

14 **Q. Are there any areas where the Company is seeking to enhance the customer  
15 experience?**

16 A. Yes. The Company is focused on effecting continuous improvement in four areas: 1)  
17 extending our service-minded culture throughout the company; 2) getting to know our  
18 customers better so that we can address their needs and interact according to their  
19 preferences; 3) making it easy to do business with us through the customer's channel of  
20 choice; and 4) providing the distribution related services and products that our customers  
21 want and need.

22 **Q. Please discuss the customer service initiatives implemented in 2016 and 2017.**

23 A. Customer Service initiatives for 2016 and 2017 include:

- 1           – A new website reflecting updated branding and improved navigation;
- 2           – An automated portal for enrolling low-income customers in the Customer
- 3           Assistance Program (CAP);
- 4           – A simplified process for calculating budget billing payments;
- 5           – A completely redesigned menu for the Interactive Voice Response (IVR) system;
- 6           in the contact center, designed with input and feedback from Duquesne Light
- 7           customers;
- 8           – A Payment Arrangement portal that simplifies the process that a Customer
- 9           Service Representative (CSR) uses to set up a payment arrangement;
- 10          – A Bill Advisor tool that considers weather and usage information to enable CSRs
- 11          to better and more thoroughly respond to customers’ high-bill inquiries; and
- 12          – An improved process whereby cross-departmental resources are engaged to
- 13          communicate with customers before and during a planned outage. The new
- 14          process includes an analysis of the number and types of customers impacted,
- 15          communication channels available based on lead time, seasonal/holiday or
- 16          business hour considerations to minimize any negative impact of the outage, and
- 17          coordination with local officials as needed.

18   **Q.    Is the Company proposing additional customer enhancements at this time?**

19   A.    Building upon the improvements discussed above, the Company is proposing to address a  
20   common area of complaint by implementing “fee free” payments for customer who  
21   choose to pay via bank card, Automated Clearing House (ACH), or cash through Western  
22   Union. Customer expectations are being set outside the utility, with an ever-increasing  
23   number of transactions being conducted via devices connected to the internet. Customers



1 expect and prefer to use their bank cards (debit or credit) to pay their bills through mobile  
2 or on-line applications for a number of reasons, including ease of use and the high degree  
3 of trust that they place in their bank or credit card issuer to quickly and securely complete  
4 a financial transaction.

5 Assessing a transaction fee for bank card transactions creates friction in the bill payment  
6 process and is not common in relation to other purchases of goods and services by  
7 customers. For many customers, paying their monthly bill is the only interaction that  
8 they have with the Company, and the experience is less favorable when a fee is charged  
9 to complete the transaction through the customer's channel of choice. The Company  
10 seeks to serve customers how and where they want to be served, and thus it is necessary  
11 to acknowledge that the cost of accepting bank card payments is a cost of doing business  
12 in this digital age.

13 **III. CUSTOMER PAYMENT TRENDS**

14 **Q. What forms of payments are currently accepted by Duquesne Light?**

15 A. Customers are able to pay through various channels and funding sources, including:

Mail	Check Money Order
Website (duquesnelight.com)	One-time payment <sup>1</sup> via ACH Auto-pay via ACH
Western Union	Cash via Western Union kiosks Debit, Credit, or ACH via phone, website, or mobile app <sup>2</sup>

16 Additionally, some customers choose to initiate their payment via their bank's website.

---

<sup>1</sup> One-time payments made at duquesnelight.com are credited to the customer's account within 2 days.

<sup>2</sup> Customers are able to get same-day credit for Western Union payments.



1 **Q. Are customers charged a fee for using any of the payment options available?**

2 A. Technically, the cost of processing all forms of payment except Western Union are  
3 embedded in customers' base rates. For customers that pay via Western Union, which is  
4 the only way that a bank card payment can be made, an additional fee of \$2.50 fee is  
5 assessed by Western Union. Duquesne Light does not receive any part of the Western  
6 Union fee.

7 **Q. How do Duquesne Light customers currently pay their bill?**

8 A. In 2017, Duquesne Light received over 5.4 million payments from residential customers.  
9 Chart 2 outlines the distribution of payments by type.

10 *Chart 2*  
11

<b>Payment Type</b>	<b>% of Payments</b>
Check	37.2%
Bank Website	21.6%
ACH/Autopay (Recurring)	19.3%
ACH/One-time payment	12.0%
Credit Card	4.9%
Debit Card	4.7%
Cash	0.4%
<b>TOTAL</b>	<b>100%</b>

12

13 **Q. What percentage of payments are made via bank card at Duquesne Light?**

14 A. Credit and debit card payments combined total 9.6% of residential payments received.

15 **Q. Are any other forms of tender accepted via Western Union?**

16 A. Yes, Western Union also accepts cash and ACH. Western Union payments comprise  
17 11.3% of the Company's residential payments.

1 **Q. Have you compared usage of debit and credit cards at Duquesne Light to that of**  
2 **other electric utilities?**

3 A. Yes. According to the Aite/ACI 2017 report, “*How Americans Pay Their Bills: Sizing*  
4 *Bill Pay Channels and Methods*”<sup>3</sup>, roughly 28% of one-time payments to electric utilities  
5 are made via debit or credit card. Thirty-one percent (31%) of recurring (autopay)  
6 payments made to electric utilities are made via debit or credit card. At 9.6% of  
7 payments made via bank card, Duquesne Light is well below the industry average.

8 **Q. Why do Duquesne Light customers use debit or credit cards less than customers of**  
9 **other utilities?**

10 A. Customers routinely tell the Company – via surveys and direct interaction in our contact  
11 center – they are dissatisfied with having to pay a fee to make their payment with a bank  
12 card. A sample of verbatim comments gathered from Duquesne Light customers via  
13 monthly customer satisfaction surveys is provided as DLC Exhibit KMS-5.

14

15 Additionally, the data suggest that many of the Company’s most vulnerable customers  
16 submit bank card or one-time ACH same-day payments via Western Union when they are  
17 delinquent or facing potential termination for nonpayment, as this is the only way to  
18 effect a same-day payment.

---

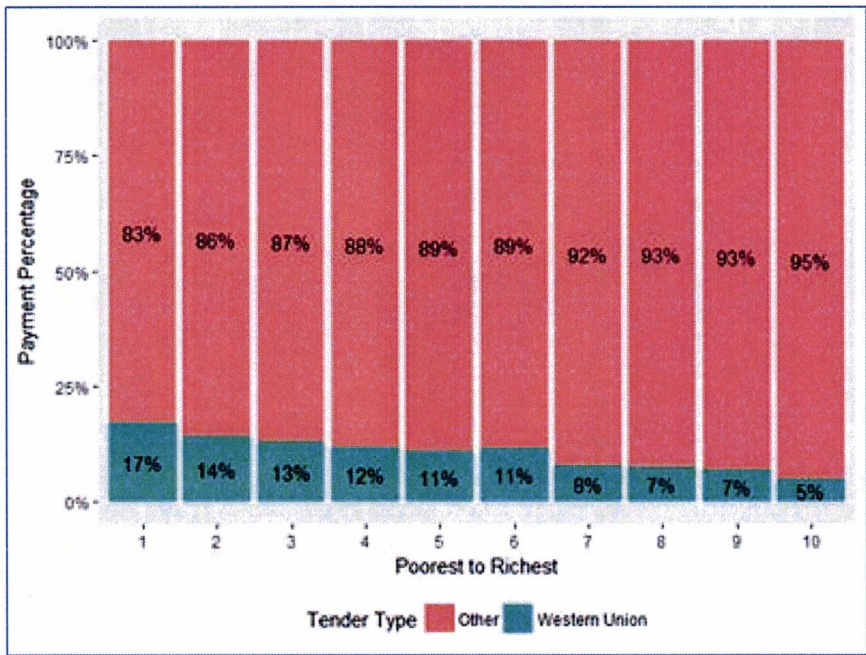
<sup>3</sup> <https://www.aciworldwide.com/-/media/files/collateral/trends/how-americans-pay-their-bills-sizing-bill-pay-channels-and-methods.pdf>.

1 **Q. Can you describe the demographics of customers who historically use debit or credit**  
2 **card payment options at Duquesne Light?**

3 A. Yes. Analysis of customer payment data indicates that CAP customers are significantly  
4 more likely to use Western Union for payments than non-CAP/other residential  
5 customers. 33.4% of CAP customers made at least one Western Union payment in 2017,  
6 whereas only 9.3% of all other residential customers paid via Western Union. CAP  
7 customers represent 6.6% of the Company's residential customer base, but 14% of all  
8 residential Western Union payments.

9 Additionally, the Company compared the penetration of Western Union payments across  
10 deciles of median household income (defined by Census data for each zip code) and  
11 found that lower-income households were more than three times as likely to pay via  
12 Western Union as high-income households. See Chart 3 below.

13 *Chart 3*



14



1 **Q. What insight can you provide as to current payment trends and customer**  
2 **expectations?**

3 A. The previously-cited AITE/ACI report indicates that younger and middle-age generations  
4 – those who represent a growing portion of our customer base -- prefer to pay via bank  
5 card. Millennials and Gen Xers pay more of their bills using debit cards than older  
6 consumers do. Seniors pay a larger percentage of bills using checks than do younger  
7 generations: 31% of seniors use checks versus only 8% for millennials.

8 Not surprisingly, the same AITE/ACI report states that the use of checks to pay bills is  
9 sharply declining; between 2010 and 2016, the percentage of bills paid by check went  
10 from 37% to 17%, while the number of bills paid via ACH went from 36% to 46%.  
11 Credit cards approximately doubled to reach 15% and debit cards went from 11% to 15%  
12 during that same period.

13  
14 The TSYS 2016 U.S. Consumer Payment Study<sup>4</sup> asked consumers: “When given a  
15 choice, what payment form do you prefer (for a one-time bill payment)?” 23% said they  
16 prefer credit card; 33% prefer debit; 5% prefer cash and 14% prefer check.

17  
18 There is strong support<sup>5</sup> for the concept that customers want to easily pay via a mobile or  
19 connected<sup>6</sup> device. Among the ~70% of consumers who own at least one connected  
20 device, the typical consumer owns *four* connected devices. As the TSYS 2016 U.S.

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<sup>4</sup> [https://www.tsys.com/Assets/TSYS/downloads/rs\\_2016-us-consumer-payment-study.pdf](https://www.tsys.com/Assets/TSYS/downloads/rs_2016-us-consumer-payment-study.pdf)

<sup>5</sup> <https://www.pymnts.com/how-we-will-pay/>.

<sup>6</sup> “Connected devices” include smartphones, computers and tablets, video game consoles, smart TVs, activity trackers and smart/sports watches, voice activated devices, wearables, and smart appliances.”

1 Consumer Payment Study indicates, these customers seek a “fluid, seamless buying and  
2 paying experience.” 66% see the potential for connected devices to help them multitask  
3 – to buy and pay for things while going about their day-to-day tasks. “They want a world  
4 in which paying for something is devoid of friction – and seamless. But not just seamless  
5 in the sense of how the payment experience happens, but in how a payment experience  
6 seamlessly becomes part of their everyday lives.” We are on the cusp of an era where a  
7 customer can initiate a payment via a voice activated device, such as an Amazon Echo.  
8 The customer would simply say, “Alexa, pay my Duquesne Light bill” and the bill would  
9 be paid via the bank card on file. Again, expectations are being set outside of the utility.

10 **Q. Why does Duquesne Light view the Western Union fee-free payment option as a**  
11 **benefit for customers and a necessary consideration in this rate case?**

12 A. First and foremost, it is about meeting customer needs and preferences. Customers  
13 consistently tell us that they want convenient payment options and do not want to have to  
14 pay a fee to pay their bill through their preferred payment type. Duquesne Light  
15 customers paid over \$1.5 million in Western Union fees in 2017.  
16 The influx of digital devices coupled with payment standards set outside our industry set  
17 greater customer expectations. Customers are generally not accustomed to paying a fee to  
18 pay a bill. Fee free acceptance is quickly becoming a cost of doing business. In fact, only  
19 in situations where a biller such as Duquesne Light partners with a third-party payment  
20 acceptance agent (like Western Union) can customers be assessed a fee for the  
21 transaction. The standard agreements between the associations (Visa, MasterCard,  
22 American Express, and Discover) and merchants/billers strictly prohibit merchants from  
23 directly charging from a fee to pay with a bank card.

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Research clearly shows that most customers prefer to pay via bank card, and the push for fee free acceptance will only grow as more customers adopt leading-edge payment technologies like Apple Pay, Samsung Pay, and Google Wallet – all of which are funded through customers’ existing bank card relationships.

Bill presentment and payment is the number-one way the Company interacts with its customers; the process gives the Company twelve opportunities each year to meet or exceed customer expectations. The 2017 J.D. Power Electric Utility Residential Customer Satisfaction Study noted that automated payment deductions via credit card yield the highest customer satisfaction in the billing and payment experience.

**Q. Will vulnerable customers be excluded from any benefit involved with a fee free bank card option?**

A. No. Analysis of Duquesne Light payment data shows that vulnerable customers – such as those in CAP – are more likely than other residential customers to pay with a bank card. Enabling fee free bank card transactions will provide financial relief to this customer segment. Customers who pay monthly via Western Union pay an extra \$30 in fees on an annual basis in the current structure. This is roughly equivalent to making an extra CAP payment over the course of the year.

The reason that this segment relies more heavily on payment via bank cards is likely two-fold. First, state and federal entities often issue benefits payments via prepaid debit card. Customers then pay a fee to use that card to pay their utility bill. Second, payments via



1 Western Union are credited to the customer's account the same day that the payment is  
2 made. Low income customers are likely less able to pay their bill ahead of the due date  
3 and need the immediacy of a bank card payment – freshly loaded with government  
4 benefits -- to avoid termination.

5 **Q. Why should the cost of bank card acceptance be socialized across all residential**  
6 **customers?**

7 A. At present, the cost of processing all other forms of tender is socialized. Approximately  
8 one-third of customers pay via check, but the cost of check processing is borne by all  
9 customers. Similarly, the cost of printing and mailing monthly bills is borne by all  
10 customers, including those who have opted to receive only an e-bill.

11

12 Previously the Company maintained a walk-in office where customers could make  
13 payments in person. The high cost of staffing and maintaining this office was also a cost  
14 borne by all customers, not just the ones who chose to visit the office. As times changed  
15 and the walk-in option was used by fewer customers, the Company made necessary  
16 changes to keep-up with contemporary payment methods; the office was closed and  
17 paying via mail-in or checking account deduction was promoted. The time has come to  
18 once again revisit how the Company meets customer expectations for paying their utility  
19 bill.

1 **IV. FEE-FREE BANK CARD ACCEPTANCE PROPOSAL**

2 **Q. What is the Company’s proposal in relation to “fee free” credit/debit transactions?**

3 A. The Company proposes to allow all residential customers to make a payment via Western  
4 Union (debit, credit, cash, or ACH) without being assessed a transaction fee. Western  
5 Union would continue to be integral in the process, as the Company cannot complete  
6 cash or debit/credit transactions without third-party processor involvement.

7

8 The cost of the service will be charged to the Company and the Company proposes to  
9 recover this cost from residential customers through distribution rates.

10

11 Certain limitations or exceptions will be put in to place to contain bankcard acceptance  
12 costs. 1) Business customers will continue to pay a transaction fee to Western Union  
13 should they choose to pay through that channel. 2) Residential customers will be limited  
14 to conducting 5 transactions of up to \$1,000 each in a 30-day period via Western Union.

15 **Q. What is the amount the Company seeks to recover in rates for fee free bank card /**  
16 **Western Union payments in this rate case?**

17 A. The Company is proposing to collect \$1.1 million per year.

18 **Q. How did the Company arrive at this figure?**

19 A. The Company based this number on discussions with its current vendor, Western Union.  
20 This figure assumes a 30% increase in Western Union usage due to the elimination of the  
21 transaction fee. The Company will solicit bids from external payment vendors to ensure  
22 that payment transaction costs are as low as possible.

1 **V. UNIVERSAL SERVICE CHARGE (“USC”) – RIDER NO. 5**

2 **Q. Please describe the USC.**

3 A. The USC is instituted as a cost recovery mechanism to recover the costs incurred by the  
4 Company to provide its Commission approved Universal Service and Energy  
5 Conservation Plan. The USC is a non-bypassable charge applicable to all residential  
6 customers who take distribution service under Rate Schedules RS, RH and RA except for  
7 residential customers in the Company’s Customer Assistance Program (“CAP”). The  
8 USC provides for the recovery of the costs, excluding internal administrative costs,  
9 associated with universal service programs provided by the Company to residential  
10 customers.

11 **Q. Are you proposing any changes to the USC?**

12 A. Yes. The Company is proposing three changes. First, the Company’s tariff presently  
13 provides that “[T]he recoverable CAP discounts will be reduced by the number of CAP  
14 participants in excess of 41,650 times the average CAP credit and arrearage forgiveness  
15 costs times 10.43%. The participation level above which the offset shall be applied will  
16 be reset in each distribution rate case.” The Company is proposing to update the  
17 participation level to reflect the estimated CAP enrollment in 2019, which is 39,088.

18  
19 Second, the Company is proposing to remove references to Low Income Home Energy  
20 Assistance Program (“LIHEAP”) auto-enrollment from Rider No. 5. Pursuant to the  
21 Company’s 2017-2019 Universal Service and Energy Conservation Plan, customers who  
22 receive a LIHEAP grant are no longer auto-enrolled in CAP. The elimination of the

1 Company's auto-enrollment program was approved by Commission Order entered March  
2 23, 2017 at docket number M-2016-2534323.

3

4 Finally, the Company is proposing to remove the following language:

5 "The CAP discount shall be reduced by the annual LIHEAP funds received by CAP  
6 customers during the previous LIHEAP program year. The annual average discount from  
7 the previous year will be calculated as the difference between the bill at current rates and  
8 the CAP payment from customers during the previous year at normalized annual sales  
9 volumes."

10

11 This language was included in the tariff to address a prior CAP Plus proposal. Pursuant  
12 to the Company's 2017-2019 Universal Service and Energy Conservation Plan. The  
13 Company does not have a CAP Plus plan. Therefore, it is appropriate to remove this  
14 language.

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

16 A. Yes.



**CUSTOMER SERVICE PERFORMANCE METRICS  
2017 FULL-YEAR AVERAGE**

<b>54.1433(b)(1) Telephone Access:</b>	
Percent of calls answered within 30 seconds	Actual: 82.06% Goal: >80%
Average busy-out rate	Actual: 0.02% Goal: 0%
Call abandonment rate	Actual: 2.65% Goal: <6.5%
<b>54.143(b)(2) Billing:</b>	
Number and percent of residential bills not rendered once every billing period	225 / 0.0425%
Number and percent of small business bills not rendered once every billing period	451 / 1.092%
<b>54.143(b)(3) Meter Reading:</b>	
Number and percent of residential meters for which the Company failed to obtain a reading in the past six months in accordance with § 56.12(4)(ii)	180 / 0.029%
Number and percent of residential meters for which the Company failed to obtain a reading in the past twelve months in accordance with § 56.12(4)(iii)	42 / 0.007%
Number and percent of residential meters for which the Company failed to obtain an actual reading under the timeframe in § 56.12(5)(i).	0 / 0
<b>54.143(b)(4) Response to disputes</b>	
The actual number of disputes for which the company did not provide a response to the complaining party within 30 days	2017 Total: 36 2017 Average: 3

# **Quarterly Update to UCARE Report**

**January – December 2017**



# Introduction

The quarterly update to the annual UCARE presents data on customer service performance for jurisdictional utilities in the electric, gas, water and telephone industries. The update provides a snapshot of overall BCS activity including the volume of consumer complaints, payment arrangement requests (PARs) and inquiries. Industry specific tables show the volume of activity for the major utilities within the electric, gas, water and telephone industries. The quarterly update contains current information that can be reviewed by utility management, consumers, Commission staff and other interested parties. The Commission will continue to produce the annual UCARE report which will present more detailed findings regarding utility performance.

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## BCS Activity

### Total Volume of Consumer Complaints, Payment Arrangement Requests and Inquiries by Industry

January through December 2017

Industry	Consumer Complaints		Payment Arrangement Requests		Inquiries
	Residential	Commercial*	Residential	Commercial*	All Classes
Electric	8,086	425	30,022	129	15,351
Gas	2,133	126	12,456	44	5,470
Water	884	47	3,582	14	2,553
Telephone	1,399	180	60	3	1,019
Other	7	0	4	0	703
<b>Total</b>	<b>12,509</b>	<b>778</b>	<b>46,124</b>	<b>190</b>	<b>25,096</b>

\*Please note, commercial customer contacts are excluded from the analyses that appear later in this report, as BCS' regulatory authority has largely been confined to residential accounts.



## Major Electric Distribution Companies

### Consumer Complaint, Payment Arrangement Request and Inquiry Statistics for Major Companies

January through December 2016/2017

Company	Residential Consumer Complaints			Residential Payment Arrangement Requests			Inquiries (Residential & Commercial)		
	2016	2017	Percent Change	2016	2017	Percent Change	2016	2017	Percent Change
Duquesne	590	588	-<1%	2,284	1,786	-22%	1,116	1,278	15%
Met-Ed	748	1,091	46%	4,432	3,722	-16%	2,276	1,896	-17%
PECO	930	1,323	42%	6,034	5,860	-3%	2,759	2,699	-2%
Penelec	677	1,014	50%	4,645	4,058	-13%	2,493	1,919	-23%
Penn Power	324	231	-29%	1,575	1,168	-26%	861	572	-34%
PPL	617	1,062	72%	11,528	9,457	-18%	3,861	3,541	-8%
West Penn	803	1,126	40%	3,254	3,431	5%	2,051	2,228	9%
<b>Total</b>	<b>4,689</b>	<b>6,435</b>	<b>37%</b>	<b>33,752</b>	<b>29,482</b>	<b>-13%</b>	<b>15,417</b>	<b>14,133</b>	<b>-8%</b>

## Major Electric Distribution Companies

### Percent of Justified Residential Consumer Complaints/Payment Arrangement Requests

#### January through December 2017

Company	Consumer Complaints		Payment Arrangement Requests	
	Number Received	Percent Justified (Closed & Evaluated)*	Number Received	Percent Justified (Closed & Evaluated)*
Duquesne	588	7%	1,786	8%
Met-Ed	1,091	12%	3,722	13%
PECO	1,323	5%	5,860	10%
Penelec	1,014	13%	4,058	12%
Penn Power	231	15%	1,168	11%
PPL	1,062	8%	9,457	12%
West Penn	1,126	11%	3,431	7%
<b>Total</b>	<b>6,435</b>		<b>29,482</b>	
<b>Average</b>		<b>10%</b>		<b>10%</b>

\*The ratio of consumer complaints or payment agreement requests found justified to the number of consumer complaints or payment agreement requests that BCS evaluated as of 01/12/18.

## Major Electric Distribution Companies

### Response Time to Residential Consumer Complaints/Payment Arrangement Requests

#### January through December 2016/2017

Company	Average Time in Days			
	Consumer Complaints		Payment Arrangement Requests	
	2016	2017*	2016	2017*
Duquesne	20.6	10.1	12.3	3.8
Met-Ed	17.7	15.7	8.1	7.7
PECO	13.7	15.5	3.7	3.9
Penelec	17.3	16.1	8.5	7.9
Penn Power	14.9	14.7	8.1	7.8
PPL	12.0	14.4	9.1	9.1
West Penn	17.8	15.8	8.6	7.7
<b>Major Electric</b>	<b>16.4</b>	<b>15.0</b>	<b>8.1</b>	<b>7.3</b>

\*The 2017 statistics are based on preliminary data on response time from the Consumer Services Information System as of 01/12/18.



## Major Natural Gas Distribution Companies

### Consumer Complaint, Payment Arrangement Request and Inquiry Statistics for Major Companies

January through December 2016/2017

Company	Residential Consumer Complaints			Residential Payment Arrangement Requests			Inquiries (Residential & Commercial)		
	2016	2017	Percent Change	2016	2017	Percent Change	2016	2017	Percent Change
Columbia	126	180	43%	684	558	-18%	455	335	-26%
National Fuel	54	111	106%	332	542	63%	108	190	76%
Peoples	159	207	30%	698	662	-5%	460	556	21%
Peoples-Equitable	118	151	28%	445	525	18%	227	208	-8%
Philadelphia Gas Works	776	985	27%	7,558	7,739	2%	3,637	3,195	-12%
UGI Gas	130	179	38%	2,182	1,315	-40%	656	434	-34%
UGI Penn Natural	76	108	42%	1,358	724	-47%	338	179	-47%
<b>Total</b>	<b>1,439</b>	<b>1,921</b>	<b>33%</b>	<b>13,257</b>	<b>12,065</b>	<b>-9%</b>	<b>5,881</b>	<b>5,097</b>	<b>-13%</b>

## Major Natural Gas Distribution Companies

### Percent of Justified Residential Consumer Complaints/Payment Arrangement Requests

#### January through December 2017

Company	Consumer Complaints		Payment Arrangement Requests	
	Number Received	Percent Justified (Closed & Evaluated)*	Number Received	Percent Justified (Closed & Evaluated)*
Columbia	180	3%	558	1%
National Fuel	111	5%	542	4%
Peoples	207	1%	662	4%
Peoples-Equitable	151	1%	525	5%
Philadelphia Gas Works	985	7%	7,739	5%
UGI Gas	179	5%	1,315	7%
UGI Penn Natural	108	6%	724	6%
<b>Total</b>	<b>1,921</b>		<b>12,065</b>	
<b>Average</b>		<b>5%</b>		<b>5%</b>

\*The ratio of consumer complaints or payment agreement requests found justified to the number of consumer complaints or payment agreement requests that BCS evaluated as of 01/12/18.

## Major Natural Gas Distribution Companies

### Response Time to Residential Consumer Complaints/Payment Arrangement Requests

January through December 2016/2017

Company	Average Time in Days			
	Consumer Complaints		Payment Arrangement Requests	
	2016	2017*	2016	2017*
Columbia	5.2	5.4	1.3	1.2
National Fuel	5.4	9.7	2.7	2.6
Peoples	4.2	3.0	1.2	0.7
Peoples-Equitable	2.1	3.0	1.3	1.3
Philadelphia Gas Works	17.9	19.3	7.8	11.7
UGI Gas	5.1	5.5	1.1	1.2
UGI Penn Natural	8.2	6.5	1.2	1.2
<b>Major Gas</b>	<b>12.0</b>	<b>12.5</b>	<b>5.0</b>	<b>8.0</b>

\*The 2017 statistics are based on preliminary data on response time from the Consumer Services Information System as of 01/12/18.



## Major Water Utilities

### Consumer Complaint, Payment Arrangement Request and Inquiry Statistics for Major Companies

January through December 2016/2017

Company	Residential Consumer Complaints			Residential Payment Arrangement Requests			Inquiries (Residential & Commercial)		
	2016	2017	Percent Change	2016	2017	Percent Change	2016	2017	Percent Change
Aqua PA	207	250	21%	701	651	-7%	257	207	-19%
PA American	420	549	31%	2,907	2,704	-7%	920	1,624	77%
Other Class A	61	46	-25%	220	181	-18%	69	65	-6%
<b>Total</b>	<b>688</b>	<b>845</b>	<b>23%</b>	<b>3,828</b>	<b>3,536</b>	<b>-8%</b>	<b>1,246</b>	<b>1,896</b>	<b>52%</b>

## Major Water Utilities

### Percent of Justified Residential Consumer Complaints/Payment Arrangement Requests

January through December 2017

Company	Consumer Complaints		Payment Arrangement Requests	
	Number Received	Percent Justified (Closed & Evaluated)*	Number Received	Percent Justified (Closed & Evaluated)*
Aqua PA	250	28%	651	8%
PA American	549	15%	2,704	17%
Other Class A	46	2%	181	4%
<b>Total</b>	<b>845</b>		<b>3,536</b>	
<b>Average</b>		<b>18%</b>		<b>12%</b>

\*The ratio of consumer complaints or payment agreement requests found justified to the number of consumer complaints or payment agreement requests that BCS evaluated as of 01/12/18.

## Major Water Utilities

### Response Time to Residential Consumer Complaints/Payment Arrangement Requests

January through December 2016/2017

Company	Average Time in Days			
	Consumer Complaints		Payment Arrangement Requests	
	2016	2017*	2016	2017*
Aqua PA	19.6	17.9	12.1	11.8
PA American	23.0	23.7	15.2	17.0
Other Class A	11.1	17.2	4.3	8.4
<b>Major Water</b>	<b>20.6</b>	<b>21.3</b>	<b>14.0</b>	<b>15.5</b>

\*The 2017 statistics are based on preliminary data on response time from the Consumer Services Information System as of 01/12/18.



## Major Local Telephone Companies

### Consumer Complaint, Payment Arrangement Request and Inquiry Statistics for Major Companies

January through December 2016/2017

Company	Residential Consumer Complaints			Residential Payment Arrangement Requests			Inquiries (Residential & Commercial)		
	2016	2017	Percent Change	2016	2017	Percent Change	2016	2017	Percent Change
CenturyLink	62	92	48%	11	5	-55%	44	40	-9%
Frontier Commonwealth	85	113	33%	6	8	33%	51	52	2%
Verizon North	68	52	-24%	1	0	-100%	44	29	-34%
Verizon PA	1,070	880	-18%	56	38	-32%	773	492	-36%
Windstream	92	144	57%	4	6	50%	47	37	-21%
<b>Total</b>	<b>1,377</b>	<b>1,281</b>	<b>-7%</b>	<b>78</b>	<b>57</b>	<b>-27%</b>	<b>959</b>	<b>650</b>	<b>-32%</b>

## Major Local Telephone Companies

### Percent of Justified Residential Consumer Complaints/Payment Arrangement Requests

#### January through December 2017

Company	Consumer Complaints		Payment Arrangement Requests	
	Number Received	Percent Justified (Closed & Evaluated)*	Number Received	Percent Justified (Closed & Evaluated)*
CenturyLink	92	40%	5	0%
Frontier Commonwealth	113	66%	8	20%
Verizon North	52	38%	0	0%
Verizon PA	880	42%	38	5%
Windstream	144	68%	6	33%
<b>Total</b>	<b>1,281</b>		<b>57</b>	
<b>Average</b>		<b>49%</b>		<b>10%</b>

\*The ratio of consumer complaints or payment agreement requests found justified to the number of consumer complaints or payment agreement requests that BCS evaluated as of 01/12/18.

## Major Local Telephone Companies

### Response Time to Residential Consumer Complaints/Payment Arrangement Requests

#### January through December 2016/2017

Company	Average Time in Days			
	Consumer Complaints		Payment Arrangement Requests	
	2016	2017*	2016	2017*
CenturyLink	9.9	10.0	5.4	6.6
Frontier Commonwealth	20.5	11.6	16.8	3.1
Verizon North	14.1	13.4	27.0	n/a
Verizon PA	14.8	13.8	13.4	8.6
Windstream	26.3	22.8	19.3	21.6
<b>Major Telephone</b>	<b>15.7</b>	<b>14.3</b>	<b>13.0</b>	<b>8.8</b>

\*The 2017 statistics are based on preliminary data on response time from the Consumer Services Information System as of 01/12/18.



## Compliance

### Residential Verified Infraction Statistics by Industry Cases Opened January through December 2017

<b>ELECTRIC</b>	<b>Duquesne</b>	<b>Met-Ed</b>	<b>PECO</b>	<b>Penelec</b>	<b>Penn Power</b>	<b>PPL</b>	<b>West Penn</b>
Chapter 56	33	71	25	77	22	64	66
Title 66 and Other	9	5	1	4	5	7	10
<b>Total</b>	<b>42</b>	<b>76</b>	<b>26</b>	<b>81</b>	<b>27</b>	<b>71</b>	<b>76</b>
<b>GAS</b>	<b>Columbia</b>	<b>National Fuel</b>	<b>Peoples</b>	<b>Peoples-Equitable</b>	<b>Philadelphia Gas Works</b>	<b>UGI Gas</b>	<b>UGI Penn Natural</b>
Chapter 56	1	7	1	2	32	6	7
Title 66 and Other	0	0	0	0	5	2	2
<b>Total</b>	<b>1</b>	<b>7</b>	<b>1</b>	<b>2</b>	<b>37</b>	<b>8</b>	<b>9</b>
<b>WATER</b>	<b>Aqua PA</b>		<b>PA American</b>			<b>Other Class A</b>	
Chapter 56	108		77			3	
Title 66 and Other	2		2			0	
<b>Total</b>	<b>110</b>		<b>79</b>			<b>3</b>	
<b>TELEPHONE</b>	<b>CenturyLink</b>	<b>Frontier Commonwealth</b>	<b>Verizon North</b>	<b>Verizon PA</b>	<b>Windstream</b>		
Chapter 30	1	5	1	5	7		
Chapter 63	63	211	53	554	299		
Chapter 64	28	40	0	71	24		
Title 66 and Other	3	7	3	35	11		
<b>Total</b>	<b>95</b>	<b>263</b>	<b>57</b>	<b>665</b>	<b>341</b>		

Infraction data on this page is accurate as of 01/22/18.

## Glossary of Terms

**Consumer Complaints** – Cases to BCS involving billing, service, rates and other issues not related to requests for payment terms.

**Infraction** – A misapplication or infringement of a Commission regulation, particularly the standards and billing practices for residential utility service.

**Inquiries** – Consumer contacts to BCS that require no follow-up investigation beyond the initial contact.

**Major Electric Distribution Companies** – Electric distribution companies with more than 100,000 residential customers.

**Major Local Telephone Companies** – Local telephone companies with more than 50,000 residential customers.

**Major Natural Gas Distribution Companies** – Natural gas distribution companies with more than 100,000 residential customers.

**Major Water Utilities** – Non-municipal water utilities with annual revenues of \$1,000,000 or more for three years in a row are classified as “Class A.” The tables in this report present individual statistics for the two largest Class A water companies, PAWC and Aqua, and for the “Other Class A” companies as a whole. The “Other Class A” water companies are Audubon Water, Columbia Water, Newtown Artesian Water, SUEZ Water Bethel, SUEZ Water PA, and York Water Company.

**Payment Arrangement Requests (PARs)** – Consumer requests for payment plans in the following situations: suspension/termination of service is pending, service is suspended/terminated and in need of restoration, or the customer wants to retire an arrearage.

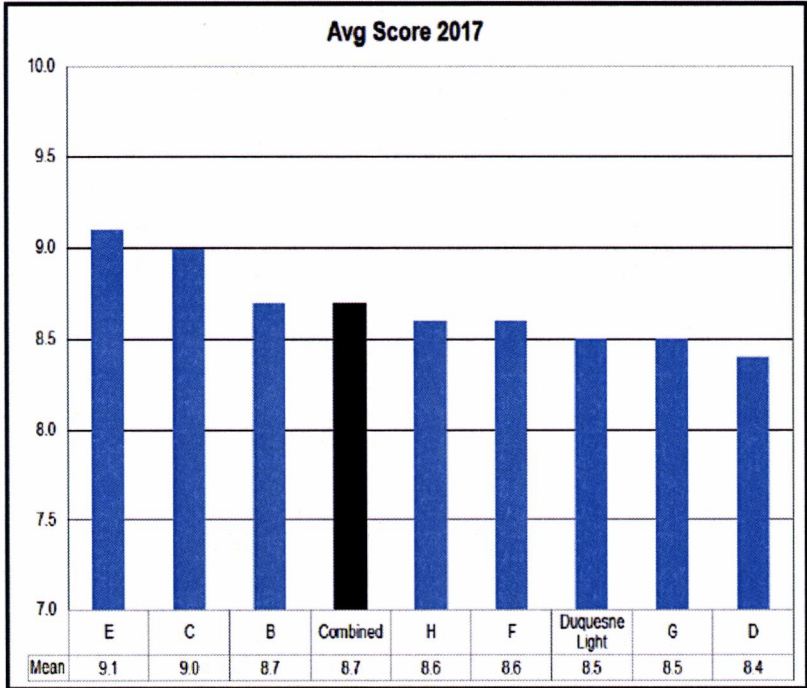
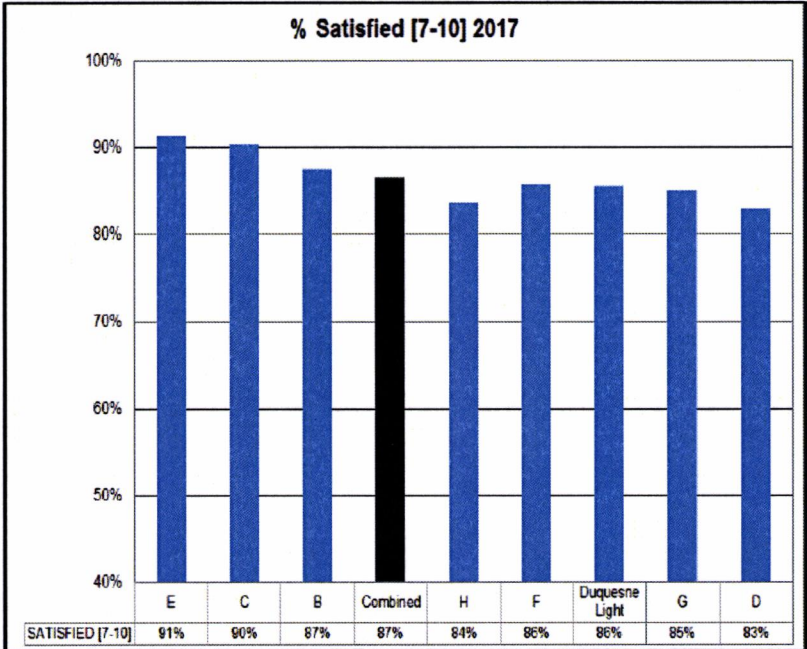
**Justified Consumer Complaints** – A consumer complaint case where, prior to BCS intervention, the company did not comply with Commission Orders, policies, regulations, reports, Secretarial Letters, tariffs or guidelines when the consumer brought the complaint to the company’s attention. The justified consumer complaint rate equals the number of justified consumer complaints for each 1,000 residential customers.

**Justified Payment Arrangement Requests** – A Payment Arrangement Request where, prior to BCS intervention, the company did not comply with Commission regulations, reports, Secretarial Letters, tariffs or guidelines. The justified payment arrangement request rate equals the number of justified payment arrangement requests for each 1,000 residential customers.

**Response Time** – The time span in days from the date BCS first contacts the utility regarding a complaint or PAR, to the date on which the utility provides BCS with its report.



**RESEARCH AMERICA 2017 SURVEY RESULTS**

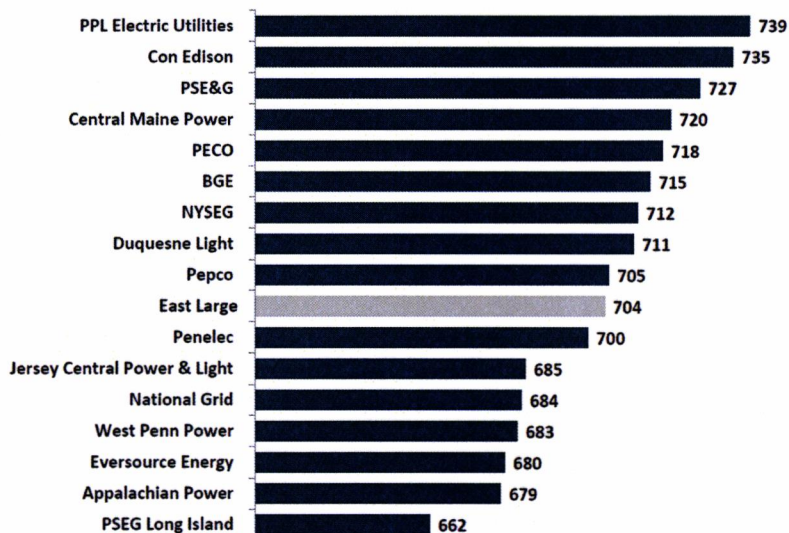




**J.D. POWER 2017 RESIDENTIAL AND BUSINESS CUSTOMER SATISFACTION**

2017 Electric Utility Residential Customer Satisfaction Study<sup>SM</sup>

**2017 Final Overall CSI: East Large Segment**

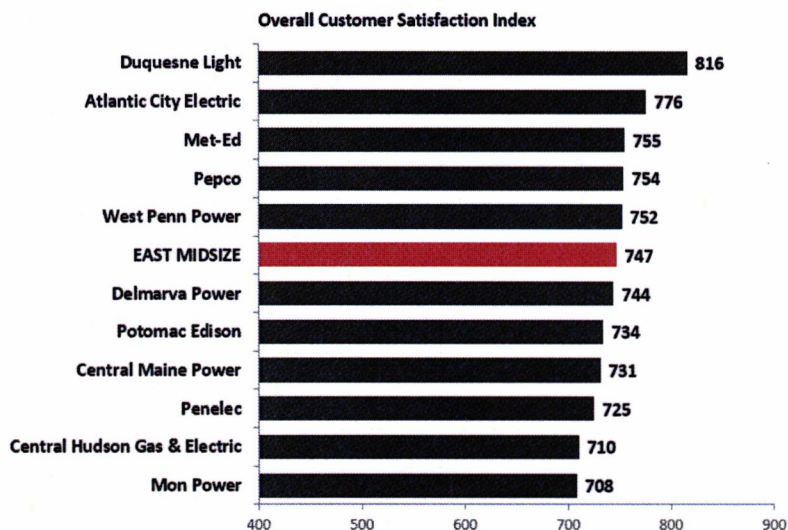


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J.D. POWER

2017 Electric Utility Business Customer Satisfaction Study<sup>SM</sup>

**2017 Overall CSI: East Midsize Segment**



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J.D. POWER

**SAMPLE OF VERBATIM CUSTOMER RESPONSES TO SURVEY QUESTION:**

***“WHAT WOULD MAKE IT EASIER TO DO BUSINESS WITH DUQUESNE LIGHT?”***

*“Be able to pay on a credit card. This would help with my personal bookkeeping as well.”*

*“Allowing electronic payment alternatives....to be accepted without fees, surcharges, or lag times.”*

*“Auto pay to credit card without fees”*

*“Being able to make same day payments without a charge”*

*“Ability to pay with credit card”*

*“Bill my credit card every month without cost to me”*

*“Don’t charge extra for billing options like to pay over the phone”*

*“Don’t charge a fee for credit card payments”*

*“Don’t charge an extra fee to pay online”*

*“Easier online payments. Today is the day of online payments.”*

*“Eliminate the fee for paying the bill through (Western Union.)”*

*“Flexibility in payment options”*

*“Having an easier way to provide a payment online instead of charging customers a fee for this; it should be a free service.”*

*“If they would quit charging when you call to pay bill over the phone”*

*“It would be great if the payment could come off of our credit card.”*

*“(It’s) like forcing them to pay to pay you.”*

*“No charge for credit card payment”*

*“Online billing portal without a fee”*

*“Provide free online payment”*

*“Stop charging for making phone payments through the ridiculous Western union”*

*"Stop charging for payment over the phone"*

*"Stop charging me a fee to pay my bill online or on the app"*

*"Stop charging me for an online payment one-time payment."*

*"Stop charging me to pay my bill online."*

*"Stop the fee for paying with a credit card"*

*"Take credit card payments"*

*"The credit card option for payments"*

*"There shouldn't be a fee to pay by phone."*

*"They need to eliminate their online pay fee"*

*"They need to get their act together as far as pay online."*

*"To not be charged to make payment over the phone and to make it less complex to make payments online"*

**BEFORE THE  
PENNSYLVANIA PUBLIC UTILITY COMMISSION**

**Docket No. R-2018-3000124**

**Duquesne Light Company**

**Statement No. 8**

**DIRECT TESTIMONY OF MARK MIKO**

**Date: March 28, 2018**

1 **Q. Please state your full name and business address.**

2 A. My name is Mark Miko. My business address is Duquesne Light Company, 411 Seventh  
3 Avenue, Pittsburgh, PA 15219.

4 **Q. What is your position at Duquesne Light Company?**

5 A. I am employed by Duquesne Light Company (“Duquesne Light” or “Company”) as Vice  
6 President and Chief Information Officer (“CIO”).

7 **Q. How long have you worked at Duquesne Light?**

8 A. I have been employed by Duquesne Light Company for 3 years.

9 **Q. What are your current responsibilities?**

10 A. In my role as CIO, I oversee technology, systems infrastructure and cyber security. I am  
11 responsible for providing oversight of the Company’s technology investments and  
12 implementations. This includes directing and managing the Company’s information  
13 technology resources, including infrastructure and architecture, application development,  
14 networks, computer and auxiliary operations and cyber security for the enterprise.

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

16 A. Prior to joining Duquesne Light, I served as CIO at Education Management Corporation  
17 (EDMC). I have nearly 20 years of technology experience in both the utility and non-  
18 utility sectors.

19 I received my bachelor's degree from the University of Pittsburgh.

20 **Q. What is the purpose of your direct testimony regarding Duquesne Light’s request for  
21 increased rates?**

22 A. The purpose of my testimony is to address significant Information Technology (“IT”)  
23 projects and programs which are expected to be completed and in-service by December 31,



1 2019. In 2017, 2018 and 2019, the Company is investing approximately \$223 Million on  
2 various IT projects to meet the needs of our customers and efficiently operate the business.

3 Those projects and programs include:

- 4 • Completion of Duquesne Light's Advanced Metering Infrastructure ("AMI")  
5 Installation Project pursuant to its Pennsylvania Public Utility Commission  
6 ("Commission") approved Smart Meter Procurement and Installation Plan at Docket  
7 No. M-2009-2123948;
- 8 • Replacement and upgrades of the Company's Work and Asset Management, Supply  
9 Chain and Financial Systems;
- 10 • Replacement and upgrades of the Company's Supervisory Control and Data  
11 Acquisition ("SCADA") systems and devices;
- 12 • Implementation of a new Electrical Model which includes a Field Inventory of the  
13 Electric Distribution System and a Graphic Job Design Tool as discussed in the  
14 testimony of Mr. Karcher (Statement No. 5);<sup>1</sup>
- 15 • Upgrades to the Company's meter telecommunications network from 3G to 4G through  
16 the implementation of Internet Protocol Version 6 ("IPv6") technology;
- 17 • Upgrades to the Company's Oracle Utility Suite ("OUS") including Customer Care &  
18 Billing and Meter Data Management Systems; and
- 19 • Annual IT programmatic capital spend to leverage and sustain technology assets  
20 including investments in Big Data, Cyber Security, Critical Infrastructure Protection  
21 ("CIP"), Disaster Recovery, business applications and IT infrastructure.

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<sup>1</sup> Mr. Karcher provides a detailed overview of the Electrical Model project in his testimony (Statement No. 5). Accordingly, the project will not be discussed in detail in my testimony.

1 **I. ADVANCED METERING INFRASTRUCTURE (“AMI”) PROGRAM**

2 **Q. Please describe the Company’s AMI project.**

3 A. Consistent with the requirements of Act 129 of 2008, Duquesne Light has been deploying  
4 “smart meter technology” since 2012. Duquesne Light filed its Initial Smart Meter  
5 Procurement and Installation Plan with the Commission on August 14, 2009. As part of  
6 that filing, Duquesne Light received Commission approval to upgrade its Customer Care  
7 and Billing (“CC&B”) system and install a meter data management system. On August  
8 4, 2015, the Company filed a petition to amend its Smart Meter Plan that included,  
9 among other things, accelerated AMI deployment from a seven to six year deployment  
10 schedule. The Commission approved certain changes to the Company’s Smart Meter  
11 Plan by Order entered April 7, 2017 at docket number P-2015-2497267. Consistent with  
12 its Commission approved Smart Meter Plan, the Company will complete its AMI  
13 deployment in 2019. As explained in the testimony of Mr. C. James Davis (Statement  
14 No.1) and Mr. David B. Ogden (Statement No. 15), the Company proposes to roll in  
15 smart meter deployment costs into base rates in this proceeding. The remaining capital  
16 costs of the AMI implementation is \$72.2 million.

17 **II. WORK AND ASSET MANAGEMENT, SUPPLY CHAIN, AND FINANCIAL**  
18 **SYSTEMS REPLACEMENTS AND UPGRADES**

19 **Q. Please describe the above project.**

20 A. The Company currently uses a multitude of disparate systems that are between 8 and 23  
21 years of age to support its Work and Asset Management, Supply Chain and Financial  
22 business processes. This initiative will consolidate these systems from over two dozen  
23 down to 12 and includes development of platform that provides better integration across  
24 business functions.

1 **Q. Why is the project described above necessary?**

2 A. The disparate systems currently being utilized by the Company makes it more difficult to  
3 create standardized business processes. This results in process inefficiencies and impedes  
4 effective monitoring of outstanding work. In addition, many of the Company's existing  
5 system versions are no longer supported by the vendor and therefore cannot be upgraded.

6 **Q. What are the estimated costs of the above project?**

7 A. \$21.5 million.

8 **III. SUPERVISORY CONTROL AND DATA ACQUISITION (SCADA)**

9 **Q. Please describe the SCADA project.**

10 A. The Holistic SCADA Program consists of several multi-year initiatives. First, the  
11 Company will replace the existing SCADA system, which consists of two applications,  
12 one of which controls the flow of electricity on the Transmission system (sometimes  
13 referred to as an Energy Management System (EMS)) and the other which controls the  
14 flow of electricity on the Distribution system (DSCADA), with a single integrated  
15 platform that will support EMS and DSCADA. This new platform will form the  
16 foundation upon which the Company will implement additional capabilities in future  
17 years.

18 The Holistic SCADA project also includes the replacement of the substation and  
19 distribution equipment, such as vipers (SCADA pole top communication device),  
20 capacitors, remote terminal units, and relays, which will simplify the Company's  
21 architecture and standardize on common protocols. In addition, as a result of Verizon  
22 eliminating 3G and moving to 4G by the end of 2019, the Company will upgrade the  
23 communication modules of pole top devices as a result and replace fully depreciated field  
24 equipment with our standard platform in order to support the distribution system. The

1 replacement of the field equipment will span several years. The effort will replace  
2 outdated technology and improve communication paths in order to facilitate the  
3 integration with the new SCADA system and to improve reliability.

4 The remainder of my testimony will focus on the DSCADA system.

5 **Q. Does Duquesne Light currently have a Distribution SCADA system?**

6 A. Yes. The existing system was originally installed in 2003 and was last upgraded in 2016  
7 to support NERC CIP requirements.

8 **Q. Is the existing Distribution SCADA system adequate to meet the Company's long  
9 term business needs?**

10 A. The existing system does not support the Company's long term business needs, as it does  
11 not have a proven Outage Management System and it does not support all Advanced  
12 Distribution Applications such as Volt/Var control. The Company plans to build an  
13 Advanced Distribution Management System (ADMS) in the future as part of its ongoing  
14 efforts to modernize its electric distribution systems. In brief, an ADMS consists of an  
15 Outage Management System (OMS) and a Distribution Management System (DMS). An  
16 OMS would build upon the electrical model discussed in the direct testimony of Mr.  
17 Karcher at Statement No. 5 and would leverage the data from the Company's SCADA  
18 systems.

19  
20 A review of existing vendor capabilities for ADMS as compared to the new vendor's  
21 capabilities indicated that the new vendor was a better strategic fit for a Company of our  
22 size and had or was in the process of deploying the solutions that support our long term  
23 business needs.

1 **Q. How is the proposed Distribution SCADA system different than the Company's**  
2 **existing system?**

3 A. The new system has a more robust system of communications with field devices, along  
4 with a Switch Order Management System, and an Operator Training simulator.

5 **Q. What are the estimated costs of the new SCADA system?**

6 A. \$39.1 million.

7 **V. METER TELECOMMUNICATION INTERNET PROTOCOL VERSION 6 (IPv6)**

8 **Q. Please describe the meter telecommunication IPv6 project.**

9 A. As part of the 3G wireless deprecation by our primary vendor in December 2019, DLC has  
10 embarked on a telecommunication upgrade project to affected field devices. The project  
11 includes upgrades of the telecommunication modules to 4G LTE or replacement of  
12 equipment to ensure continued sustainable operations. The upgrade includes devices on  
13 the Advanced Metering Infrastructure.

14 **Q. What are the estimated costs of the IPv6 project?**

15 A. \$15.9 million.

16 **VI. ORACLE UTILITY SUITE UPGRADE (OUS)**

17 **Q. Please describe the OUS project.**

18 A. The Oracle Utility Suite is a group of modules that works together to enable utilities to  
19 deliver reliable, secure, and scalable technologies and processes that deliver results for our  
20 customers. DLC has implemented four modules of the Suite: CC&B, MDM (Meter Data  
21 Management); MWM (Mobile Workforce Management); and WAM (Work and Asset  
22 Management). The integration between the modules is Oracle's Service Oriented  
23 Architecture (SOA). Industry best practice is to perform an upgrade of all modules every



1 three years and hardware approximately every five years. DLC's version of OUS was  
2 purchased in 2009. The hardware is equally aged. We are engaged in a project to upgrade  
3 all versions of the OUS, including Oracle SOA, and the related hardware.

4 **Q. What are the estimated costs of the OUS project?**

5 A. \$32 million.

#### 6 **VII. IT PROGRAMMATIC SPEND**

7 **Q. Please describe the initiatives that comprise the IT programmatic investments.**

8 A. The IT programmatic investments encompass both Business and IT Transformation  
9 initiatives. Business Transformation modernizes business systems to enhance business  
10 processes to be on par with other utilities and rationalize the application portfolio. IT  
11 Transformation enhances IT solutions to current industry standards to provide  
12 collaboration tools and business analytics, including Big Data, to increase efficiency and  
13 effectiveness and to keep systems current to ensure and minimize risks. Specific  
14 categories of investment include Cyber Security and Big Data. Cyber Security  
15 investments support a holistic approach to achieve and maintain reliable, resilient and  
16 agile operations: focused on the NIST framework core elements of protection,  
17 identification, detection, response and recovery. Big Data investments provide analytics  
18 that lead to efficiencies, customer insights, and revenue enhancements, laying the  
19 foundation for data mining, Artificial Intelligence (AI), predictive analytics and  
20 optimization.

21 **Q. What are the estimated costs of the IT programmatic capital spend?**

22 A. \$36.5 million.

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

2 A. Yes, it does.