improvement in its CSI. Table 3 below illustrates ETI's overall Business Customer CSI for the past five years:

Table No. 3
Business Customer Satisfaction Study
Comparison 2009 - 2013

Year	2009	2010	2011	2012	2013
Business	584	662	666	672	687

Source: J.D. Power & Associates

Q12. HAS ETI SEEN ANY IMPROVEMENTS IN THE BUSINESS CUSTOMER SUB-CATEGORIES EVALUATED BY J.D. POWER AND ASSOCIATES?

A. Yes. ETI has improved in business customer perception for all six sub-categories for each year when comparing 2009 through 2013. ETI showed an improvement of 109 index points, or 17.7% increase, for power quality and reliability; 111 index points, or 20.8% increase, for price; 103 index points, or 19.3% increase, for billing and payment; 89 index points, or 16.1% increase, for corporate citizenship; 107 index points, or 20.1% increase, for communications; and 109 index points, or 17.4% increase, for customer service. Table 4 below illustrates the improvement in each business customer sub-category when comparing ETI from 2009 through 2013:

Table No. 4
Sub-Category Business Customer Satisfaction Study
Comparison 2009 - 2013

Year	2009	2010	2011	2012	2013
Power Quality & Reliability	613	717	693	705	722
Price	533	609	631	631	644
Billing & Payment	632	705	713	715	735
Corporate Citizenship	550	621	640	635	639
Communications	530	571	607	606	637
Customer Service	626	733	712	722	735

Source: J.D. Power & Associates

Q13. OVERALL, HOW WOULD YOU DESCRIBE ETI'S BUSINESS CUSTOMER OVERALL CUSTOMER SATISFACTION INDEX COMPARISON FROM 2009 THROUGH 2013?

A. As noted in the previous explanations, ETI has made significant progress in its business customer perception and improvement in overall customer satisfaction with ETI's services. ETI was ranked the highest (1st) in the south midsize utility segment and received the Highest Customer Satisfaction Award from J. D. Power and Associates. ETI was noted for its improved performance related to price reasonableness, ability to restore power in a timely manner, providing quality power, providing accurate information about an outage, involvement in local charities and civic organizations, efforts to develop energy supply plans for the future, providing a variety of energy conservation programs, and taking action to take care of the environment.

Q14. HOW ARE THE LARGE C&I CUSTOMERS SURVEYED?

A. ETI's large C&I customers are benchmarked through a different company, TQS Research, Inc. ETI is surveyed on the customer's overall satisfaction with the Company. The survey ratings are benchmarked among other utilities in the nation. The percentage rating is based on a scale of 1 to 10, with 1 being the lowest score and 10 being the highest rating. A percentage factor is calculated noting the percent of customers that rate ETI's overall satisfaction with a survey rating of 8, 9 or 10.

Q15. WHAT ARE THE RESULTS OF THE LARGE C&I CUSTOMER BENCHMARK STUDIES?

A. The results of the large C&I studies show that ETI improved its overall satisfaction rating from 65% in 2009 to 81% in 2013, a 24.6% increase in its overall satisfaction ratings. Table 5 below illustrates the improvement in each large C&I customer survey from 2009 through 2013:

Table No. 5
Large C&I Customer Satisfaction Study
Comparison 2009 - 2013

Year	2009	2010	2011	2012	2013
Large C&I Customer	65%	79%	80%	82%	81%

Source: TQS Research

Q16. WHAT DO YOU CONCLUDE FROM THE LARGE C&I SURVEY RESULTS?

A. 81% of customers are very satisfied with ETI's overall services it provides. Based on the benchmark studies provided by TQS Research, Inc., C&I customers view ETI as a very favorable company in its provision of electric service.

Q17. CAN YOU IDENTIFY ANY REASON FOR THE IMPROVEMENT FOR CUSTOMER SATISFACTION RATINGS?

A. Yes. ETI's large C&I customers view ETI as having improved in its reliability of service, providing quality of service, providing information on energy efficiency measures, and reasonableness of price.

Q18. DOES ETI'S CUSTOMER SERVICE DEPARTMENT USE THESE TYPES OF STUDIES IN THE NORMAL COURSE OF ITS BUSINESS?

A. Yes, this type of third-party analysis is useful in gauging how successful the Company's customer service activities are from the standpoint of our customers. Such comparison provides a utility manager an indication of what the customer's perception is of the Company and the services it provides the customer.

Q19. WHAT CAN YOU CONCLUDE FROM THE CUSTOMER SATISFACTION PERFORMANCE STUDY?

A. ETI continues to provide quality service to its customers. Based on the customer satisfaction performance studies conducted by J.D. Power and Associates and TQS Research, Inc., the Company has received favorable customer satisfaction ratings for the services it provides.

IV. LOW-INCOME PROGRAMS

Q20. PLEASE DESCRIBE THE ETI ORGANIZATION THAT CURRENTLY ADMINISTERS LOW-INCOME PROGRAMS.

A. ETI's Customer Operations Support Department currently administers ETI's low-income programs. ETI Customer Operations Support is a functional department within the Customer Service Department of ETI.

Q21. WHAT LOW-INCOME PROGRAMS ARE ADMINISTERED BY ETI?

A. The ETI Customer Operations Support Department administers or is involved with the following low-income programs: The Power to Care, Beat the Heat, and the Public Benefit Fund ("PBF") program. The Customer Operations Support Department also networks with social agencies on low-income assistance issues.

Q22. PLEASE DESCRIBE THE POWER TO CARE PROGRAM.

A. The Power to Care is a low-income program administered in Texas by Project CARE of Texas, Inc., a 501(c)(3), non-profit corporation, chartered in the State of Texas. The purpose of The Power to Care is to provide financial assistance for energy-related expenses to eligible ETI customers who have demonstrated a need for assistance. This program is funded by voluntary contributions from employees and customers. Entergy Corporation, the parent company of the six Entergy Operating Companies (including ETI), matches the voluntary contributions from its various regulatory jurisdictions in Texas, Louisiana, Mississippi and Arkansas, dollar for dollar, up to $500,000 annually. The Power to Care uses various nonprofit organizations to validate customer eligibility to receive pledges for emergency payments toward customer utility bills. During the test year, The Power to Care allocated over $494,000 to partner agencies for ETI customers' assistance.

Q23. PLEASE DESCRIBE THE BEAT THE HEAT PROGRAM.

A. The Power to Care and ETI partner with local nonprofit organizations to distribute oscillating fans to elderly, disabled, and low-income customers to lessen the impact of the summer heat on these customers. The Beat the Heat program is funded by The Power to Care and the Entergy Companies' shareholders. Thirteen hundred oscillating fans were distributed in 2013 to ETI customers.

Q24. DOES ETI PROPOSE TO INCLUDE COSTS ASSOCIATED WITH THE POWER TO CARE OR BEAT THE HEAT PROGRAMS IN BASE RATES?

A. No. The Power to Care and Beat the Heat costs are paid for by contributions from ETI customers and employees and the Entergy Companies' shareholders.

Q25. PLEASE DESCRIBE THE PBF PROGRAM.

A. Through ETI's PBF program, eligible low-income customers see a credit on their bills, the size of which is determined by the funding level authorized for the PBF program, the number of customers enrolled in the PBF program, and the average kWh usage of the PBF customers.

Q26. PLEASE DESCRIBE YOUR CURRENT JOB RESPONSIBILITIES AS THEY CONCERN THE PBF PROGRAM.

A. I am responsible for customer service activities related to administration of ETI's PBF program. In particular, my department oversees the enrollment process and calculation of the billing factor to ensure the accurate distribution of funds, and serves as the point of contact for the Staff of the Public Utility Commission of Texas ("PUCT") and Solix, Inc. ("Solix") for issues related to PBF program administration. I will discuss below the efforts of Solix as it relates to the PBF program.

Q27. WHAT IS THE OBJECTIVE OF ETI'S PBF PROGRAM?

A. Retail Electric Providers ("REPs") that provide service in the Electric Reliability Council of Texas ("ERCOT") deregulated service area must provide funding for credits to be applied to customer bills. This program within ERCOT is known as LITE-UP Texas. ETI, which is not in ERCOT, nevertheless administers an internal public benefit fund to provide relief in the form of credits to its low-income customers similar to, although not exactly like, the LITE-UP Texas program offered within ERCOT.

Q28. WHAT IS THE CURRENT LEVEL OF FUNDING FOR THE PBF PROGRAM?

A. ETI currently funds the PBF program at $2.5 million annually.

Q29. WHAT AMOUNT IS ETI PROPOSING TO RECOVER ANNUALLY THROUGH BASE RATES FOR ITS PBF PROGRAM AND WHY?

A. ETI requests an annual recovery of $2.5 million through base rates for the PBF program. In 2010, the funding level for PBF was increased from $2.0 million to $2.5 million. ETI recognized a 25% increase in enrollment to 42,000 participants in its PBF program in 2010. In 2011, ETI recognized the same enrollment of 42,000 participants and 41,000 in 2012. Because of the stable enrollment figure, the Company recommends the funding level remain at $2.5 million.

Q30. PLEASE DESCRIBE HOW ETI PROPOSES TO ADMINISTER THE PBF PROGRAM ON A GOING-FORWARD BASIS.

A. At the end of each month, new qualifying customers will be enrolled in the PBF program, and those customers that no longer qualify will be removed from the program. In April each year, ETI will estimate the May through September kWh usage for those customers actually enrolled, based on historical usage. Then, during the months of May through September, enrolled PBF customers will receive a credit based on their actual monthly kWh usage times a factor which is determined by the total kWh usage of enrolled PBF customers during those months and the annual level of PBF funding included in ETI's rates. In an effort to distribute the amount of PBF funding authorized for each program year by September, the factor will be adjusted monthly to account for changes in enrollment and any over/under distribution of funds in the prior months. Any over/under distribution of PBF funds at the end of each program year will carry over as an adjustment to the level of funds to be distributed in the next program year.

Q31. DOES THIS PROPOSAL DIFFER FROM THE MANNER IN WHICH ETI CURRENTLY ADMINISTERS THE PROGRAM?

A. No. ETI administers PBF credits to enrolled PBF customers during this five-month period of May through September. Administering PBF credits over five months concentrates the available assistance to eligible

customers during the summer months when it is needed the most. This also aligns ETI's PBF program more closely with the LITE-UP Texas program under which eligible ERCOT customers receive bill credits during the same five-month period.

Q32. WHAT CRITERIA ARE USED TO DETERMINE CUSTOMER ELIGIBILITY FOR THE PBF PROGRAM?

A. To be eligible to receive a credit under ETI's PBF program, a customer must have a household income that is not more than 125 percent of the federal poverty guidelines or receive assistance under the SNAP (food stamp), Medicaid, or Temporary Assistance to Needy Families ("TANF") programs administered by the Texas Health and Human Services Commission ("HHSC"). These eligibility requirements are consistent with the eligibility requirements for the ERCOT LITE-UP Texas program, except that ETI's PBF program is also available to customers who receive benefits from the TANF program.

Q33. IS THERE ANOTHER ENTITY THAT IS INVOLVED IN ADMINISTERING ETI'S PBF PROGRAM AND, IF SO, WHAT IS THAT ENTITY'S ROLE?

A. Yes. Solix assists both the State of Texas, with LITE-UP Texas, and ETI, with the administration of its PBF program. With regard to ETI's PBF program, Solix provides an automatic enrollment process to match ETI customer accounts with Texas HHSC program enrollment data and

provides ETI with a file of accounts eligible for its PBF program. The self-enrollment and verification process used by LITE-UP Texas is also available to assist ETI customers with enrollment in ETI's PBF program. Because some customers might qualify by virtue of their household income level, Solix mails self-enrollment information to those customers that did, but no longer, qualify for the PBF program based on HHSC assistance. Solix provides a web page and a toll-free number to its phone center for additional information to facilitate the self-enrollment process.

Q34. HOW MANY CUSTOMERS ARE CURRENTLY ENROLLED IN ETI'S PBF PROGRAM?

A. There are approximately 41,000 customers currently enrolled in the Company's PBF program.

Q35. HAVE YOU DETERMINED WHAT THE ESTIMATED PBF CREDIT WOULD BE TO CUSTOMERS UNDER THE PBF PROGRAM?

A. Yes. Based on the total actual kWh usage for customers receiving PBF credits from May through September 2012 and the $2.5 million funding level, the estimated PBF credit was $0.00850 per kWh. Based on actual data for May and June 2013, the estimate was increased to $0.00900 for July through September 2013. This estimate could vary depending on changes in the levels of enrollment and total PBF customer kWh usage.

Q36. WHAT RESPONSIBILITIES DOES ETI HAVE WITH REGARD TO ADMINISTERING THE PBF PROGRAM?

A. ETI Customer Operations Support Department has the following administrative responsibilities with respect to the PBF program:

(A) serve as contact point for PUCT Staff and Solix for issues related to PBF program administration;

(B) provide Solix with residential customer data for its monthly HHSC cross-reference enrollment process;

(C) receive monthly matched customers file from Solix and update identified accounts and enrollment;

(D) provide a manual self-enrollment process for those customers who qualify but are not receiving HHSC benefits; and

(E) maintain PBF disbursement data for periodic reports and to support monthly factor calculations. Current monthly reporting includes the monthly credit factor, number of enrolled customers, monthly kWh usage and monthly dollars disbursed.

Q37. WHAT ADMINISTRATIVE COSTS ARE ANTICIPATED IN ASSOCIATION WITH THE PBF PROGRAM?

A. Administrative costs associated with ETI's PBF program include: advertising; promotional events; media coverage to inform eligible customers of the PBF program; and IT programming associated with program administration, preparing and maintaining customer information, preparing periodic reports, and modifying existing accounting systems. Historically, ETI's PBF program administrative costs have been minimal and have not reduced the credits to enrolled PBF customers.

Q38. ARE THERE ANY CONCERNS REGARDING THE ADMINISTRATION OF THE PBF PROGRAM IN THE FUTURE?

A. Yes. Due to recent legislation (in reference to Sec. 39.9039. ELIMINATION OF SYSTEM BENEFIT FUND BALANCE), ETI is concerned about administering its current PBF program. As noted above, ETI relies upon Solix to assist in the administration of the Company's PBF program. If, due to the elimination of the System Benefit Fund Balance, Solix no longer administers the State of Texas' Lite Up Program and declines to continue such service for ETI, ETI's ability to administer the PBF program would become very difficult. The Company relies heavily upon Solix's ability to match customers who qualify for the Lone Star Card program to ETI's customer records in order to qualify customers for its PBF program.

Q39. IS ETI'S PBF PROGRAM CONTINGENT UPON HAVING IN PLACE AN ADMINISTRATOR WHO CAN READILY ASSIST IN IDENTIFYING ELIGIBLE CUSTOMERS?

A. Yes. ETI would not offer this program without the assistance of a qualified administrator to help identify eligible customers.

V. TARIFF REVISIONS

Q40. PLEASE EXPLAIN WHICH TARIFF REVISIONS YOU ARE SUPPORTING?

A. I am supporting revisions to a number of schedules and sections within ETI's tariff. In particular, I support the revisions to the following that are more substantive in nature:

- Portions of Miscellaneous Electric Service Charges (Schedule MES)
- Residential (Schedules RS and RS-TOD)
- General Service (Schedule GS and GS-TOD)
- Large General Service (Schedule LGS and LGS-TOD)
- Large Industrial Power Service (Schedule LIPS and LIPS-TOD)
- Area Lighting Service (Schedule ALS)
- Street and Highway Lighting (Schedule SHL)
- Street and Highway Lighting-LED (Schedule SHL-LED) (NEW)
- Portions of Terms and Conditions Applicable for Electric Service
- Electric Extension Policy

Q41. CAN YOU GENERALLY DESCRIBE THE REVISIONS YOU ARE SUPPORTING?

A. Yes. The majority of the revisions submitted on the schedules, terms and conditions, and policies I am supporting are related to:

- policy changes or wording changes contained within the rate schedules to update or clarify the language used in the schedule based on current practices utilized by ETI;
- changes to Terms and Conditions to coincide with changes to rates, riders and PUCT Substantive Rules or to clarify customer and Company obligations;
- a new line item charge identified in ETI's Miscellaneous Electric Service (Schedule MES); and
- a new rate schedule (Schedule SHL-LED).

Q42. DO YOU CO-SPONSOR ANY RATE SCHEDULES?

A. Yes. I co-sponsor with Company witness Shawn B. Corkran changes to the MES (Miscellaneous Electric Service) Rate Schedule, which is included as Rate Filing Package Schedule Q-3. ETI has included a summary of the fees included in that rate schedule in the testimony of Company witness Corkran. I also sponsor the Terms and Conditions to the Company's provision of electric service. The schedules that I sponsor as set forth above are included in Schedules Q-3 and Q-8.8 of the Company's Rate Filing Package.

Q43. PLEASE DESCRIBE RATE SCHEDULE MES.

A. Rate Schedule MES captures fees associated with service provided beyond the normal requirements of providing electric service. These fees

are charged to those customers who cause the Company to incur these costs.

Q44. PLEASE DESCRIBE THE TYPE OF SERVICES THAT ARE REPRESENTED IN THE REVISED RATE SCHEDULE MES.

A. There are currently nine services represented in Schedule MES:

- Connection – A charge associated with connecting a new point of delivery to ETI's system.
- Trip Fee – A charge associated with responding to a customer's request to dispatch an employee to the customer's location when, due to no fault of the Company, the work could not be performed.
- Non-Sufficient Funds ("NSF") Charge – A charge associated with processing accounts when a customer's bill payment is rejected from a customer's financial institution.
- Disconnect/Reconnect – A charge associated with reconnecting an existing account that has been disconnected from ETI's system in circumstances such as where service has been terminated or suspended as a result of failure to pay bills, failure of the customer to comply with the terms and conditions for service, to prevent fraud or abuse, or a reconnection of a seasonal home or camp that was disconnected at the request of the customer.

- Temporary Metered Service Connection – A charge for a temporary service connection requested by a customer for a special need (*e.g.*, construction power for a new building).
- Payment by Draw Draft and Levelized/Equal Payment – This is a credit on a customer's bill for participation in both Company programs.
- Remote Meter Installation – A charge for the installation of a non-demand type Off-site Meter Reading ("OMR") meter when there is a threat of violence against one of ETI's employees/contractors or when there is a refusal to grant access to the Company's meter at the customer's premise or at the customer's request.
- Tampering Deterrent – A charge on every documented occurrence of meter tampering. The charge would be applied on each occurrence and serves as a deterrent to meter tampering and unauthorized use of service.
- Pulse Meter Installation/Interval Data Recorder Installation – A charge for customer-requested installation of the Company's pulse meter/interval data recorder equipment.

Q45. WHAT ARE THE REASONS FOR THESE FEES?

A. The Company is offering its customers service options and, therefore, charging fees based upon the costs of providing those services. The

Company's proposed changes in several of these fees will more closely align the fees with the costs of providing the service and thus will allow the customers who use a particular service to pay the associated costs for such services.

Q46. WHAT FEES IN THE MES TARIFF IS THE COMPANY PROPOSING TO CHANGE.

A. The Company is proposing to change fees for the following services: the trip fee, disconnect/reconnect fee for after hour service and the temporary metered service connection fee.

Q47. DID THE COMPANY CONDUCT A COST STUDY FOR THE PROPOSED CHANGES TO THE MES TARIFF?

A. Yes, the changes are based on the cost study shown in the testimony of Company witness Corkran, Exhibits SBC-6A-6F. This cost study also supports those fees for which the Company is not seeking any changes.

Q48. PLEASE DESCRIBE THE CHANGES TO THE CURRENT TRIP FEE.

A. The current trip fee is proposed to increase from $13 per occurrence to $14 per occurrence, and is based on the cost study shown in the testimony of Company witness Corkran, Exhibit SBC-6B.

Q49. PLEASE DISCUSS THE SEPARATE DISCONNECT/RECONNECT FEE FOR AFTER-HOURS SERVICE.

A. The after-hours reconnection service fee applies when a customer requests service to be reconnected after normal business hours. The after-hours time period is 4:30 p.m. to 7:00 p.m. Monday through Friday and 8:00 a.m. to 3:00 p.m. Saturday. The disconnect/reconnect fee for after-hours is proposed to be changed from $29 per occurrence to $30 per occurrence and is based on the cost study shown in the testimony of Company witness Corkran, Exhibit SBC-6C. The reconnection of service after 7:00 p.m. (Monday through Friday, after 3:00 p.m. Saturday or Sunday) would only occur in Company-determined extreme emergency cases. The after-hours fee may be applied to emergency reconnects on a case-by-case basis.

Q50. PLEASE DESCRIBE THE CHANGES TO THE TEMPORARY METERED SERVICE CONNECTION FEE.

A. ETI currently provides two services to temporarily metered customer premises.

The first temporary meter service is for connection when additional Company facilities are not required, and the second service is for all other temporary meter services. The price for a temporary meter service connection where distribution lines are readily available and the installation of additional poles and lines are not necessary is currently

$118 for residential construction, and it is proposed to increase to $124 based on the cost study shown in the testimony of Company witness Corkran, Exhibit SBC-6D. For other temporary service, the cost is currently $118, and it is proposed to increase to $124. Tariff and other general service costs may also apply in addition to these fees.

Q51. IS THE COMPANY ADDING ANY NEW CHARGES TO SCHEDULE MES?

A. Yes. ETI is adding one additional charge to Schedule MES related to field meter tests.

Q52. WHAT IS THE BASIS FOR ADDING THE CHARGE RELATED TO FIELD METER TESTS?

A. ETI historically has maintained the provision related to charging a customer for a subsequent customer-requested field meter test in its Terms and Conditions, Section 12.1. For organizational clarity, the Company is moving the language pertinent to that charge to Schedule MES.

Q53. CAN YOU PLEASE EXPLAIN WHAT IS MEANT BY SUBSEQUENT REQUESTED FIELD METER TEST?

A. Yes. Per Section 12.1.1 of the Company's Terms and Conditions and support from the PUCT Substantive Rule: "Company shall, upon request

of a Customer, test the accuracy of Customer's meter at no charge to Customer." Pursuant to Section 12.1.2: "If the meter has been tested by Company, or by its authorized agency, at the Customer's request, and within a period of four years the Customer requests a new test, Company shall make the test. However, if the subsequent test finds the meter is within the accuracy standards established by ANSI, Company may charge the Customer a fee which represents the cost to test the meter, but this charge shall in no event be more than $15.00 for a residential Customer."

Q54. PLEASE DESCRIBE WHAT ETI PROPOSES TO ADD TO SCHEDULE MES.

A. Although the Company does not plan to change its practice and continue to follow the same guidelines noted above, ETI does propose to add a new line item charge for subsequent customer-requested field meter tests as described in its Terms and Conditions, Section 12.1.2.

Q55. DOES ETI PROPOSE TO CHANGE THE FEE FOR A SUBSEQUENT CUSTOMER REQUESTED FIELD METER TEST?

A. Yes. The Company proposes to charge a subsequent customer requested meter test at a rate of $30.00 for each subsequent meter test as long as the meter test results are within the accuracy standards established by ANSI. The analysis for this fee is based on the cost study shown in the testimony of Company witness Corkran, Exhibit SBC-6F.

Q56. DOES THAT CONCLUDE THE CHANGES TO SCHEDULE MES?

A. Yes, it does.

Q57. DOES THE COMPANY RECOMMEND ANY CHANGES TO SCHEDULE RS AND RS-TOD?

A. Yes. The Company is adding language to clarify a charge to a customer with a second service delivery point on his residential property. For example, a customer may add a metered barn, large shop, or additional facility to his residential property that is metered separately from his primary residence. Language has been added to Schedules RS and RS-TOD to clarify that a customer with appurtenant domestic purposes will be charged at a residential rate and each meter will be billed separately.

Q58. IS THE LANGUAGE ADDED TO BOTH SCHEDULE RS and RS-TOD the SAME?

A. Yes. The language is the same for both rate schedules.

Q59. DOES ETI PROPOSE ANY CHANGES TO SCHEDULES GS, GS-TOD, LGS, LGS-TOD, LIPS AND LIPS-TOD?

A. Yes. The Company will address these schedules individually. ETI proposes to make minor changes in Section II "*Net Monthly Bill*" of each schedule solely for the purpose of maintaining a consistent format across

schedules. There will be no impact on billing or bill presentation for each of these schedules.

Q60. DOES THE COMPANY RECOMMEND CHANGES TO SCHEDULE ALS?

A. Yes. The Company proposes: (1) adding language in Section III "Net Monthly Bill" to clarify the Company's definition of a standard pole for area lighting; (2) adding language in Section IV "General Provision" to clarify that the term "replacement costs" refers to a functioning light, not an existing light, facilities included in a standard light installation, and address payment as a result of vandalism; 3) adding twelve additional rate codes to Section III of Schedule ALS for new light and pole rental offerings.

Q61. PLEASE IDENTIFY THE CHANGE IN SCHEDULE ALS, SECTION III "NET MONTHLY BILL" REGARDING THE DEFINITION OF A STANDARD POLE.

A. In Section III, when there is not an existing pole, the Company offers customers the option of leasing a pole rather than purchasing a pole. The Company proposes clarifying language of a "Standard Wooden Pole" in this section to be a 35 foot, Class 5 pole. The pole is described according to ANSI Standards as a wooden pole 20' - 50' long with a minimum horizontal load of 1900 lbs. and a minimum tip circumference of 19".

Also, if the pole is not accessible by truck, then the customer may be charged for additional costs such as additional labor and material not included in the normal job.

Q62. PLEASE ADDRESS THE CHANGES NOTED IN SECTION IV "GENERAL PROVISION."

A. In Section IV, the Company is proposing language to address the inclusion of facilities of a standard light installation for area lighting service. The standard installation is an overhead service on an existing wood pole and one overhead span of secondary service. The second revision in Section IV includes a clarification of the replacement fee that applies to a functioning light which is a light that exists in the field and is fully operational. The third change in Section IV is the addition of language to address the performance of maintenance to an area light that is repeatedly damaged or vandalized by a third party. The Company proposes language that states: "Company may remove a light which has been repeatedly damaged or vandalized by a third party. Four repair requests within a three month period are to be considered repeatedly. In lieu of removal, Customer may pay, in advance, the cost to repair or replace the street light."

Q63. PLEASE DESCRIBE THE ADDITIONAL RATE CODE CHANGES TO SCHEDULE ALS, SECTION III.

A. The Company is proposing to offer customers in ETI's service territory twelve additional rate codes with nine codes specific to new light offerings and three codes for pole lease rental charges related to decorative lighting.

Q64. PLEASE PROVIDE IN DETAIL WHAT TYPE OF ADDITIONAL LIGHT AND POLE RENTAL OFFERINGS THE COMPANY IS PROPOSING IN SCHEDULE ALS.

A. ETI is proposing to offer nine different types of lights and three pole rental options:

1) Security Light:

320W Metal Halide ("MH") Open Bottom Security

2) "Shoebox" Decorative Lights:

400W High Pressure Sodium ("HPS") Decorative Light

1000W HPS Decorative Light

320W MH Decorative Light

1000W MH Decorative Light.

3) Residential Decorative Lights:

150W HPS Acorn

150W MH Acorn

150W HPS Colonial

250W HPS Colonial

4) Pole Rentals:

Steel Bronze Anchor Based 30' pole ("Shoebox" installation)

Steel Bronze Anchor Based 39" pole ("Shoebox" installation)

Fiberglass 18" pole (Residential Decorative Light installation)

Q65. PLEASE EXPLAIN IN GENERAL THE NEW LIGHT AND POLE RENTAL OFFERINGS FOR SCHEDULE ALS.

A. ETI is proposing to add new light and pole rental offerings to Schedule ALS, Section III *Net Monthly Bill*, "Security Lights," as an additional option for customers for leasing private area lights.

The Company is proposing to offer three different styles of decorative lighting: Shoebox, Acorn and Colonial style lights. Shoebox lights serve a market segment that ETI's current fixtures cannot accommodate. Shoebox fixtures provide a combination of functionality and aesthetics required by, for example, certain customers in connection with private roadways, car dealerships, parking lots and perimeter lighting. The Shoebox lights will be mounted at varying heights using steel poles. (ETI proposes two types of anchor-based steel poles: the 30 foot square metal pole, or the 39 foot round tapered metal pole.)

The Acorn fixture provides a lighting alternative in a decorative fixture to complement estates, parks, motels and residential

developments. The Acorn fixture will be available with a 150W HPS or 150 W MH and utilize the 18 foot fiberglass pole.

The Colonial fixture captures an old-fashioned look, while utilizing the latest technology, customer market segment is same as Acorn fixture, and provides a lower cost alternative to the Acorn fixture. The Colonial fixture will utilize the 150W or 250W HPS lamp and also utilize the 18 foot fiberglass pole.

Q66. PLEASE DESCRIBE ETI'S PROPOSED CHANGES TO THE STREET AND HIGHWAY LIGHTING TARIFF (SCHEDULE SHL).

A. Rate Group D and E are both energy-only rates. Rate Group E applies only to customer owned and maintained incidental lighting (*e.g.*, underpass lighting, high mast lighting, etc.), while Rate Group D applies to all other types of lighting owned and maintained by the customer. Customers in both Rate Groups are charged at a rate of $0.03707 per kWh. Accordingly, the Company is recommending that Rate Groups D and E be combined in order to eliminate duplication and render the rate schedule easier to understand and use. There are currently a total of four customers in Rate Group E. These customers will be added to Rate Group D and will not recognize any impact to their service or cost increase as a result of the consolidation.

Q67. PLEASE EXPLAIN ETI'S PROPOSED CHANGES TO SCHEDULE SHL, SECTION IV "SERVICE CONDITIONS."

A. There are three proposed changes to Section IV. First, ETI recommends adding language specifying that the Company's standard light replacement for mercury vapor ("MV") and failed HPS lights will be an equivalent HPS light type fixture. Because MV fixtures are no longer being manufactured, the HPS light fixture will be the preferred replacement light type unless the Company is directed in writing by the customer to use a different type light fixture. Second, the Company has added language to Section IV to protect the Company from claims related to street light failures due to conditions not controlled by the Company such as fire, riot, explosion, flood, etc. The purpose for this addition is to make the rate schedule consistent with the language contained in the PUCT approved Agreement for Street Lighting Service. This language has been approved by the PUCT since 1978. Third, ETI proposes language to address the Company performing repeated maintenance to street lights damaged or vandalized by a third party. The Company proposes language that states: "Company may remove a light which has been repeatedly damaged or vandalized by a third party. Four repair requests within a three-month period are to be considered repeatedly. In lieu of removal, Customer may pay, in advance, the cost to repair or replace the street light."

Q68. DOES THE COMPANY PROPOSE ANY NEW SCHEDULES RELATED TO STREET AND HIGHWAY LIGHTING?

A. Yes. The Company proposes to add a new Street and Highway Lighting schedule specific for Light Emitting Diode ("LED") technology, which ETI proposes to name Schedule SHL-LED.

Q69. WHAT DOES THE COMPANY PROPOSE AS AN LED OFFERING IN SCHEDULE SHL-LED?

A. As described in Section VI, "LED Feasibility Study," of my direct testimony below, the Company proposes to offer one type of LED light (cobra head) with four different wattages that are equivalent to the 100w, 150w, 250w and 400w HPS-type lights currently used by ETI under Schedule SHL. The benefits and discussion of utilizing the new LED technology can be found in Section VI of my direct testimony.

Q70. IS THE LANGUAGE USED IN SCHEDULE SHL-LED DIFFERENT FROM THE LANGUAGE IN SCHEDULE SHL?

A. The language in both schedules is substantially the same except for the type of light offered by the Company.

Q71. DO YOU SUPPORT THE PRICING FOR SCHEDULE SHL-LED?

A. No, I do not. The prices for Schedule SHL-LED are supported by Company witness Myra L. Talkington.

Q72. ARE THERE ANY CHANGES TO THE COMPANY'S TERMS AND CONDITIONS APPLICABLE TO ELECTRIC SERVICE?

A. Yes, I will cover substantive changes to Sections 6.8, 8.2, 12.1, and 12.2. The changes that I describe below coincide with changes to rates, riders and PUCT Substantive Rules or clarify customer and Company obligations.

Q73. PLEASE STATE THE CHANGES PROPOSED BY ETI FOR TERMS AND CONDITIONS, SECTION 6.8 "AMOUNT OF DEPOSIT AND INTEREST FOR PERMANENT RESIDENTIAL, COMMERCIAL, AND INDUSTRIAL SERVICE AND EXEMPTION FROM DEPOSIT."

A. In Section 6.8.2 "Failure to Remit Deposit" of its Terms and Conditions, the Company proposes to add language, consistent with Substantive Rule 25.24(c)(2), specifying that at the time of connection, a customer can elect to not be charged an initial deposit and instead pay the total amount due on the customer's current bill, provided the customer has not exercised this option previously in the past twelve months.

Q74. PLEASE IDENTIFY THE PROPOSED CHANGE TO SECTION 8.2 "DISCONNECTION WITH NOTICE" OF THE COMPANY'S TERMS AND CONDITIONS.

A. ETI proposes to add new language to be referenced as Section 8.2.5 of the Company's Terms and Conditions, to coincide with Substantive

Rule 25.51(c)(4). Pursuant to such language, customers who fail to remedy harmonics problems within the timeframe specified by the Company and refuse to allow the Company to remedy the problem may be disconnected five working days after receiving written notice of the Company's intent to disconnect.

Q75. PLEASE DESCRIBE THE PROPOSED CHANGES TO SECTION 12.1, "METER TESTS," OF THE COMPANY'S TERMS AND CONDITIONS.

A. In Section 12.1.2, "Additional Meter Testing Requests," of its Terms and Conditions, ETI proposes to identify the fee to be assessed customers who request an additional meter test within a four-year period and the meter is within ANSI accuracy standards. The Company proposes to identify such fees in its Schedule MES (Miscellaneous Electric Services) rate tariff.

Q76. HAS ETI PERFORMED A COST STUDY FOR THE SUBSEQUENT METER TEST IDENTIFIED IN ITS TERMS AND CONDITIONS?

A. Yes. As described above, the Company has identified that the actual cost to test a meter is $30. Such fees will be included as a line item in Schedule MES. The analysis for this fee is based on the cost study shown in the testimony of Company witness Corkran, Exhibit SBC-6F.

Q77. PLEASE DESCRIBE THE CHANGES PROPOSED TO SECTION 12.2, "BILL ADJUSTMENT DUE TO METER ERROR," OF THE COMPANY'S TERMS AND CONDITIONS.

A. In Section 12.2, "Bill Adjustment due to Meter Error," of its Terms and Conditions, the Company proposes to add language clarifying the Company's method for calculating a back-billing to a customer found to have tampered, bypassed or diverted its electrical usage through the meter. The Company will calculate the back-billing based upon the daily average usage per month for the last twelve months prior to the meter not registering usage. If the prior 12 months' usage is not available, the Company may estimate the billing based upon available usage information at that service location or average use for comparably sized service locations used in similar manner during a similar time of year.

Q78. PLEASE DESCRIBE THE CHANGES TO THE ELECTRIC EXTENSION POLICY.

A. ETI is proposing changes to Section I, "New Load of Less Than 2500KW", of its Electric Extension Policy for the primary purposes of treating all customers, irrespective of the amount of new load greater or less than 2500kW, in a more consistent manner with a structured philosophy of calculating its revenue justification of new load and providing the benefit to its customers.

Q79. CAN YOU PROVIDE ADDITIONAL DETAIL REGARDING THE PROPOSED CHANGES TO THE ELECTRIC EXTENSION POLICY?

A. Yes. Section I of the Electric Extension Policy has been re-written to compliment the language written in Section II, and clarify the process for calculating the four-year revenue justification amount associated with new and additional load.

Under the proposed language, the four-year justification remains the same, but the Company may elect to secure new and additional load via a contract, may require a minimum bill contract, revenue justify the new load based on base revenues and, at Company's discretion, require the Customer to provide and maintain financial security until all applicable revenues are equal to the cost of construction of the revenue justified new electric service facility.

ETI also proposes that if the customer's reimbursement amount (based on an estimate of the cost of the new electric service facility) is equal to or greater than $100,000 or the Company elects to apply a true-up option, the Company will true-up to actual costs within 60 days of notice of the trued-up amount to the customer.

The Company will project its investment in the new electric service facility, including, but not limited to, material, labor, labor adders, cost of third party vendors and consultants, costs associated with procurement of real property rights and necessary approvals, taxes, capital suspense charges, overheads and associated tax gross-up charges.

Q80. ARE THE PROPOSED TARIFF REVISIONS THAT YOU HAVE ADDRESSED REASONABLE AND NECESSARY?

A. Yes. These changes are reasonable and necessary to incorporate changes in the Commission's Substantive Rules that are not reflected in ETI's current tariffs, to reflect better the costs to serve ETI's customers, and to incorporate changes in schedules that I have referenced in my testimony.

VI. LED TECHNOLOGY FEASIBILITY STUDY

Q81. WHAT IS THE "LED TECHNOLOGY FEASIBILITY STUDY"?

A. In ETI's last rate case, Docket No. 39896, Finding of Facts No. 187 in the Commission's Final Order states: "It is appropriate to require ETI to prepare and file, as part of its next base rate case, a study regarding the feasibility of instituting LED-based rates and, if the study shows that such rates are feasible, ETI should file proposals for LED-based lighting and traffic signal rates in its next rate case."

Q82. HAS ETI MET THIS REQUIREMENT?

A. Yes. ETI has conducted the feasibility study as directed and submits the study for PUCT review.

Q83. WHAT ARE THE CONTENTS OF THE FEASIBILITY STUDY?

A. The study was conducted to determine: 1) if ETI's current rate tariffs can accommodate use of LED technology for street lighting and traffic signals; 2) the feasibility of the Company offering Company owned LED technology for street and highway lighting based on the research of case studies; 3) the type of LED light fixtures that are available in the market and appropriate to serve customers in ETI's service territory; and 4) ETI's final recommendation to the PUCT.

Q84. HAS ETI DOCUMENTED THE RESULTS OF ITS FEASIBILITY STUDY?

A. Yes. The feasibility study is my Exhibit HVP-1.

A. Current Schedules

Q85. CAN LED TECHNOLOGY BE USED UNDER ETI'S CURRENT RATE SCHEDULES?

A. Yes. LED technology can be used under ETI's Street and Highway Lighting (Schedule SHL) and Traffic Signal Service (Schedule TSS) schedules but as an energy-only type service for customer-owned facilities.

Q86. PLEASE DESCRIBE THE USE OF LED TECHNOLOGY IN SCHEDULE SHL.

A. ETI's Schedule SHL, Section III under Rate Group D permits customers to own, maintain and repair street and highway lighting fixtures and states that the Company will provide the energy and bill the customer for energy use only on a per kWh basis. This feature is available for all types of lights, including LED.

Q87. PLEASE DESCRIBE THE USE OF LED TECHNOLOGY SERVED UNDER SCHEDULE TSS.

A. TSS also contains an energy-only rate similar to the provisions described above for Schedule SHL that is applicable to the use of LED bulbs in traffic signals.

Q88. DOES THE CUSTOMER HAVE ANY RESPONSIBILITY FOR THE INVENTORY OF EQUIPMENT WHEN USING AN ENERGY-ONLY PROVISION IN SCHEDULE SHL OR TSS?

A. Yes. The customer is responsible for providing the Company an inventory of light fixtures or bulbs and reporting such equipment inventory to ETI by type of light or bulb, wattage, and location of such equipment. The customer will own and be responsible for the repair and maintenance of these lights. This will allow the Company to accurately calculate the customer's monthly billing.

Q89. DOES EITHER OF THESE RATE SCHEDULES PRESENT AN OPPORTUNITY FOR ETI CUSTOMERS TO ADVANCE THE LED TECHNOLOGY?

A. Yes. A customer can currently use existing Schedules SHL and TSS for LED lights which it owns, repairs and maintains.

Q90. PLEASE DESCRIBE IF ETI HAS LED STREET LIGHT TECHNOLOGY SPECIFICATIONS.

A. ETI reviewed its Distribution Standards and Engineering group to determine if there was an existing specification for street and highway LED technology equipment for ETI or other Entergy Operating Companies. At the beginning of ETI's feasibility study, the Company had no specific rates, specifications, or plans to offer LED leased street lighting rates in Texas. Since there were no specifications written for LED lighting fixtures, ETI found there were no LED street light fixtures currently available to be tested or installed as a "demonstration project."

With no LED specifications, ETI requested its Distribution Standards and Engineering group to research and write a proposed specification for LED lighting equipment that could be used throughout the Entergy system. Because of the relative newness of LED street lighting technology and the continuing evolution of this technology, ETI worked with its lighting vendors in order to take advantage of their research,

knowledge and expertise in LED street lighting. Their knowledge and technical expertise was used to make a decision on the wattage and type of LED street lighting fixture that could be used as an "equivalent" replacement for its current inventory of HPS and MV street lights that are currently in the field.

As a result of this request, a specification was written by the Distribution Standards and Engineering group and approved in January 2013. The specification was supplied to Entergy's lighting equipment vendors to establish the availability, type of LED lighting equipment and equipment pricing.

Q91. HAS ETI IDENTIFIED WHICH VENDORS WILL PROVIDE THE LED STREET LIGHT TECHNOLOGY?

A. Yes. The Distribution Standards and Engineering group has selected two vendors (Acuity and Cooper Lighting Companies) to provide the leased LED lights. These vendors were selected because they offer the appropriate equipment and their ability to meet or exceed Entergy standards and specifications.

B. Case Studies

Q92. PLEASE DESCRIBE THE ACTIVITY AND RESULTS OF THE CASE STUDIES REVIEWED AS PART OF THE FEASIBILITY STUDY.

A. ETI reviewed four case studies as part of its evaluation process. They included studies performed in 1) Knoxville, Tennessee, 2) Benton County, Tennessee, 3) Asheville, North Carolina, and 4) Baytown, Texas.

Q93. PLEASE DESCRIBE THE ATTRIBUTES OF THE KNOXVILLE CASE STUDY.

A. The Knoxville case study was an assessment performed in 2008 by EPRI, Tennessee Valley authority ("TVA"), and Knoxville Utilities Board. The research in the study involved replacing ten 250-watt HPS cobra head type lights with ten 99-watt LED cobra head fixtures. The case study evaluated a 24-month period.

Q94. WHAT WERE THE RESULTS OF THE KNOXVILLE STUDY?

A. In this 24-month test, in addition to energy savings, it was found that the main advantage of LED fixtures were the fixtures' capacity to send a more visually pleasing light only where it is needed, making them an ideal candidate to replace conventional outdoor lighting. However, the study also identified increased cost and maintenance issues associated with LED fixtures.

This study found "one of the most productive advantages of LED lighting and a characteristic not accounted for with traditional assessment methods is the light shines where you want it to and little is wasted. Conventional lamps for street and area lighting radiate light in nearly all directions, resulting in 30% of the light traveling skyward or trespassing into unintended places. Early reports from the field readily confirmed a superior overall efficiency and uniformity of coverage provided by LED fixtures." Another finding was that "the whiter, almost blue color emitted from the LED gives the appearance of more light, although the LED fixture actually produces less light when measured using traditional techniques. In addition to appearing whiter, the light output from the LED fixtures appears more even on the ground." These observations were verified by the photometric design received from the manufacturer along with measurements taken on site. However, the study noted that the significant advantage of LED technology of only putting light where it is needed was lost when utilizing decorative fixtures.

It was also found during the 24-month test period that the "LED fixtures consumed more power during the winter than during the summer months, but the light output also increased in cold temperatures. Temperature does not affect the power consumption of fixtures such as metal halide or high pressure sodium."

Q95. WHAT IS THE FINAL CONCLUSION OF THE KNOXVILLE STUDY?

A. The Knoxville study concluded that "in some applications, LED street light fixtures provide acceptable illumination and energy savings. However, saving energy is not necessarily the same as saving money." In addition to higher fixture costs, the total costs over time must be taken into account. The study noted that replacement drivers for the fixtures can cost between $120 and $300 and potential increased labor costs due to variations in fixture design and the need to remove the fixture for repair in some instances. From a performance aspect, LED technologies are capable of replacing conventional lighting and saving a significant amount of energy. "However like many new technologies, the cost of retrofitting existing light fixtures, at least for now remains a challenge."

Q96. PLEASE DESCRIBE THE ATTRIBUTES OF THE BENTON COUNTY CASE STUDY.

A. Another case study performed by EPRI in 2008 was done in conjunction with the Tennessee Valley Authority ("TVA") and Benton County Electric System. Their study was conducted for 28 months and included replacement of seven 150-watt HPS cobra head lights with 100-watt LED cobra head lights in a residential street located in Camden, TN. The study's purpose was to evaluate the energy consumption of LED street light fixtures, photometric data, and light levels measured in foot candles for both LED and HPS fixtures.

Q97. WHAT WERE THE RESULTS OF THE BENTON COUNTY CASE STUDY?

A. The study found through its measurements of light levels that the HPS fixtures provided intense lighting directly below the fixture, with intensity falling sharply with distance from the area directly below the fixture. Although the average light output of the LED street lights was less than the HPS fixtures, they provided a more even distribution of light over the whole measured area.

As a result of studying LED street light fixtures in the lab and in the field, this study found several disadvantages of LED street lighting including lower efficiency values than traditional lamps, unexpected driver failures, sensitivity to power quality issues, less flexibility in replacing the light source, and high initial installation costs. Additionally, this study discovered that the lights interfered with the operation of HAM radio sites. This issue was resolved by the addition of a specifically tuned ferrite bead on the input power lead.

Q98. WHAT IS THE FINAL CONCLUSION OF THE BENTON COUNTY CASE STUDY?

A. The Benton County Study concluded that in some applications, LED street light fixtures provide acceptable illumination and energy savings. The study also states in its conclusions that "there are many factors that influence a decision to accept or reject LED street lighting technologies

and authorities are neither vocal nor unified in their guidance. Standards for LEDs are evolving but a consensus does not yet exist on the proper application of LED lighting."

Q99. PLEASE DESCRIBE THE ATTRIBUTES OF THE CITY OF ASHEVILLE CASE STUDY.

A. The City of Asheville, NC study was performed by Progress Energy Carolinas ("PEC"), in conjunction with the City of Asheville. In 2010, the City Council of Asheville adopted a goal of reducing its carbon footprint by 20% over a five-year period. To meet this goal, the City explored replacing over 8,000 MV and high intensity discharge (HPS and metal halide) street light fixtures with LED street light fixtures. Asheville's electric utility, PEC, evaluated the financial aspects of utilizing LED street lighting.

Q100. WHAT WERE THE RESULTS OF THE CITY OF ASHEVILLE CASE STUDY?

A. PEC determined that, although an LED street light would use less energy than the light it would replace, the monthly lease rate for that LED street light including the energy, was higher due to the higher fixture price. This would result in the City paying higher rates for its street lights. PEC explored the City's interest in purchasing the fixtures themselves in exchange for a lower rate. As a result, PEC developed (with utility

commission approval), a new rate labeled "Customer owned LED street light rate." The rate was designed such that PEC would own the poles but the City would purchase the LED fixtures, which PEC would install and maintain. The City would be responsible for supplying replacement fixtures if any existing LED street light fixture failed for any reason. In return, the City would pay an energy charge plus a monthly light maintenance fee. This rate would allow the City to take advantage of its ability to borrow money at a lower rate than PEC. PEC also developed an LED-based street lighting rate for lights that it would own, install and maintain.

Q101. WHAT IS THE FINAL CONCLUSION FOR THE CITY OF ASHEVILLE CASE STUDY?

A. Asheville chose to take service under the rate permitting it to purchase and supply the fixtures in return for a lower rate. To purchase the LED street light fixtures, Asheville utilized a $272,000 grant from the Federal Energy Efficiency Community Block Grant and borrowed an additional $3,800,000 financed by three 10-year bonds. This program will help the City of Asheville meet its goal of reducing its carbon footprint by 20% by 2015 in addition to reducing its street light expense by approximately 50%.

Q102. PLEASE DESCRIBE THE ATTRIBUTES OF THE BAYTOWN CASE STUDY.

A. The City of Baytown, TX (population 73,000) conducted a pilot project that involved replacing street lights on Interstate 10 and Loop 330, within city limits.

Q103. WHAT WERE THE RESULTS OF THE BAYTOWN CASE STUDY?

A. The City of Baytown, because of its population, is now responsible for maintaining and paying the electric bill for over 370 lights. These lights were conventional 400-watt HPS cobra head fixtures originally installed and maintained by the Texas Department of Transportation ("TxDot").

The City initially considered LED street lighting technology based on the potential for reduced maintenance. The City did not have a "street light crew" to do the maintenance and had to hire a contractor each time light maintenance was needed. They initiated a three-month pilot in order to demonstrate to TxDot officials that LED street lights were a viable option. At the end of the pilot, TxDot agreed with the City of Baytown and gave them permission to replace the lights.

The City replaced its current street lights with a 250-watt LED street light and found LED lights reduced maintenance issues, and are recognizing an approximate 50% savings in its electric bill. These lights are metered, which captures all consumption including the bulb and ballast. Two years into the program, the City of Baytown was satisfied

with the installation of the LED lights, found that the failure rate has been less than 1%, and that the lights are saving electricity.

Q104. WHAT IS WAS THE FINAL CONCLUSION OF THE BAYTOWN STUDY?

A. The vendor for the City of Baytown projected initially in 2010 that the fixture cost would be approximately $1,200. After the pilot program was completed, the City of Baytown placed an order and the fixture cost was reduced to approximately $800 per fixture. The City of Baytown is looking at additional re-lighting opportunities.

Q105. IN SUMMARY, WHAT HAS ETI CONCLUDED FROM THE FOUR CASE STUDIES?

A. ETI's conclusion of the four case studies is summarized below:

Positive Results:

- LED street lighting is efficient;
- LED street lighting, specifically cobra head type fixtures direct more light to the road surface, less back light and less light to the sky, which results in the same level of light, measured in foot candles on the surface as other types of light it replaces;
- LED street lighting offers a better light spectrum;
- LED street lighting offers better color rendition as compared to HPS street lights;
- LED street lights come on instantly;

- LED street lights appear to offer the potential for maintenance savings; LED fixtures and the light emitting diodes offer a longer life span than conventional lighting types. Manufacturers' claims vary from 50,000 to 100,000 hours;
- LED street lights do not contain mercury;
- LED street lighting technology continues to improve;
- LED street lighting efficacy or its light conversion efficiency, measured in lumens/watt, continues to improve.

Negative Results:

- While LEDs have been in use in various applications for decades, their application as street lighting is relatively new concept and, in the field, claims regarding maintenance and longevity remain unproven;
- LED lighting produces less lumens and additional poles or infrastructure may be needed to satisfy both existing standards and customer expectations;
- LED lighting can be displeasing to viewers because of perceived glare from the fixture;
- LED lighting equipment is more expensive than its equivalent HPS or MH fixtures at this time;
- LED street light fixtures produce less "back light" and therefore illumination on sidewalks may be reduced.

All of the reports discussed above contend that the technology and the life expectancy of the street light fixtures and its components will improve, and the maintenance savings will be verified. Additionally, these reports are optimistic that the efficiency of LED street lighting will improve, including the design of the various styles of fixtures. The reports also contend that, as LED street lights gain a larger share of the existing street lighting market, prices will continue to decline.

Q106. DID ETI IDENTIFY ANY CITIES CURRENTLY USING LED STREET LIGHTS?

A. Yes. Several articles regarding actual installation of LED street lighting in San Antonio, Texas and Fort Fairfield, Maine were reviewed.

Q107. PLEASE DESCRIBE THE CITY OF SAN ANTONIO'S USE OF LED STREET LIGHTS.

A. In late 2012, CPS Energy, the municipally owned electric utility serving the City of San Antonio, began a project to convert 25,000 city-owned street lights to LED fixtures. San Antonio sought the conversion due to the fixtures being an energy-efficient low-maintenance product that provided a superior light source.

Q108. WHAT WERE THE RESULTS OF THIS CONVERSION?

A. Shortly after the first group of LED fixtures was installed, a problem developed with the fixtures failing, which resulted in CPS Energy discontinuing the installation. Upon further investigation, it was determined that a design defect allowed moisture to enter the fixture resulting in its failure. The 2,000 LED street lights already installed had to be removed and the 25,000 lights received from the manufacture had to be returned for a modification. Also, CPS Energy requested that the manufacturer redesign the light's sensor due to an unidentified issue experienced with the installed lights.

Q109. DID CPS ENERGY RESUME THE INSTALLATION OF LED STREET LIGHTS?

A. Yes. Despite these issues, CPS Energy has continued with this project.

Q110. PLEASE DESCRIBE FORT FAIRFIELD USE OF LED STREET LIGHTS.

A. In September 2010, the town of Fort Fairfield completed a project to replace 175 HPS street lights with LED street lights. The purpose of the installation was to reduce the town's electrical energy consumption and save money.

Q111. WHAT ARE THE RESULTS OF THIS PROJECT?

A. Two years after the completion of the project, Fort Fairfield had experienced premature failures of approximately half of the LED street lights. The manufacturer of the LED fixtures, Sylvania, was consulted and investigated the failures of the LED fixtures and determined that there was an error in the manufacturing process that caused the lights to fail prematurely.

Because the lights were under warranty, they were replaced by the manufacturer. The Sylvania representative stated, "LED lighting is still a new technology. As we learn more, the amount of errors in manufacturing has decreased."

Q112. IN SUMMARY, WHAT HAS ETI CONCLUDED FROM THE REVIEW OF SAN ANTONIO'S AND FORT FAIRFIELD'S USE OF LED STREET LIGHTING?

A. These real life applications of LED street lighting highlights the fact that LED street lighting is a new technology and there will be growing pains until the design and manufacturing of the lights matures. Therefore it is important that anyone, whether utility, city, or state, use manufacturers that can meet required specifications, have the experience in street light manufacturing, and have the financial and technological wherewithal to correct issues which are likely to occur.