Lake Lure Community Meeting with Duke Energy

A community meeting was held on February 11, 2019 at Lake Lure Town Hall to discuss electric service to the town and surrounding areas. Lake Lure staff worked with concerned citizens to organize the meeting with Duke Energy officials. Approximately 40 residents attended the gathering and several expressed their frustration with the frequency and duration of outages they have experienced, most notably during the snow storm that brought approximately 12" of snow to the area on December 9, 2018. The residents had questions about several things, including Duke Energy's vegetation management program, storm response plans, and policy for converting lines to underground.

After a period of comments from the residents, Craig DeBrew (Duke Energy's Local Government and Community Relations Manager for Cleveland, Henderson, Polk, Rutherford, and Transylvania Counties) thanked the attendees for taking time out of their schedules to come and provide feedback. He emphasized Duke's commitment to provide safe, reliable, and affordable electricity and apologized for failing to meet their customer's expectations. Mr. DeBrew stated he and his teammates are committed to doing everything they can to make the service to Lake Lure as good as it can possibly be. He then had the other attendees from Duke introduce themselves and briefly discuss their role during a major storm. (A list of Duke Energy representatives is included below.) Mr. DeBrew then made a presentation that covered several topics, including:

Craig DeBrew pictured on the far right in the navy jacket with a team from Duke Energy. The team is joined by Lake Lure Mayor Kevin Cooley, Town Manager, Shannon Baldwin and Fire Chief/Emergency Management Coordinator, Dustin Waycaster.)

- **Electric System Design Philosophy and Operation**
  - ✓ Designed to maximize reliability – clear temporary faults quickly and isolate permanent faults to minimize number of customers impacted
- **Common Causes of Outages**
  - ✓ Storms, trees, trees outside the Right of Way (ROW), animals, vehicle accidents, third party interference, equipment failure, planned outages
- **Transmission Infrastructure serving the Lake Lure Substation**
  - ✓ Wider ROW on transmission lines results in high reliability

- ✓ A 44 kV tap line from the Turners Shoals (Lake Adger) switching station provides power to the Lake Lure substation, which is located near the dam.
- ✓ There are two transmission lines providing a grid connection to the Turner Shoals switching station; one from Campobello and second from Spindale

- **Distribution facilities serving the communities around the lake**
  - ✓ Two 12 kV distribution feeders serving the area
  - ✓ Circuit #1201 serving the Rumbling Bald/Fairfield area; 1608 customers; 40 miles of exposure
  - ✓ Circuit #1202 serving the Lake Lure Town Hall/Chimney Rock/Bat Cave areas; 2052 customers; 81 miles of exposure
  - ✓ The remoteness of the area limits the ability to have ties with other substations and feeders
- **Nine-year outage history on Circuit #1202 for Lake Lure Town Hall**
  - ✓ Number of minutes out per year, less planned outages for maintenance
  - ✓ Minutes out has been fairly consistent, the outlier is 2018 which is due to being out 45 ½ hours due to the snow storm
  - ✓ Minus the snow storm, 2018 compares favorably with the previous 8 years (see charts)
  - ✓ Due to the mountainous terrain, trees outside Duke's 30' ROW present a very significant problem. Over the past four years, 75% of the minutes out have been due to trees outside the ROW. Duke has experienced several outages due to trees on the opposite side of the road falling into their feeder.
  - ✓ Converting the feeder backbone to underground would be extremely expensive. Due to the required concrete duct bank configuration, Duke's experience is that the cost is in the range of $1,250 per foot. So for example, the cost to convert the 5 miles of feeder backbone from the substation to Town Hall would be in the range of $30,000,000. It is not a viable option based on the cost vs benefit.
- **Nine-year outage history on Circuit # 1201 Fairfield Mountain Fire Department**
  - ✓ Number of minutes out per year, less planned outages for maintenance
  - ✓ Minutes out per year has been fairly consistent, the outlier is 2018 which is due to being out 62 ½ hours due to the snow storm
  - ✓ Minus the snow storm, 2018 is in line with the previous 8 years (see charts)
  - ✓ Due to the mountainous terrain, trees outside our 30' ROW present a very significant problem. During 2018, 91% of the minutes out have been due to trees outside the ROW.
  - ✓ This problem has been exacerbated in recent months due to record rainfall. Approximately 80'' of rainfall in 2018 verses 40'' for a normal year.
- **Vegetation Management Activities**
  - ✓ Duke has a 30' right of way (ROW) on their distribution lines, which is 15' on each side of the line. They have been trimming the lines based on circuit performance, which has been approximately every 10 years. The Lake Lure circuit was last trimmed in 2017 and the Fairfield circuit will be trimmed in 2019
  - ✓ They also identify and remove 'hazard trees' each year. Hazard trees are dead/diseased/dying trees <u>outside the ROW</u> that are at high risk of falling into Duke's main feeder backbone.

- **System upgrades to increase reliability and reduce customer outage times.**
  - ✓ Duke has taken a number of measures over recent years to enhance customer reliability, including: upgrading the Lake Lure substation; extending the three-phase feeder backbone and installing larger wire thru Lake Lure, Chimney Rock and Bat Cave; Upgrading the Fairfield circuit by adding a second set of conductors; Installed electronic reclosers to automatically sectionalize outages; Installed additional opening points to better isolate damaged facilities and minimize customer impacts.

After the presentation the Duke Energy team answered a variety of questions from the audience. Takeaways from the meeting include:

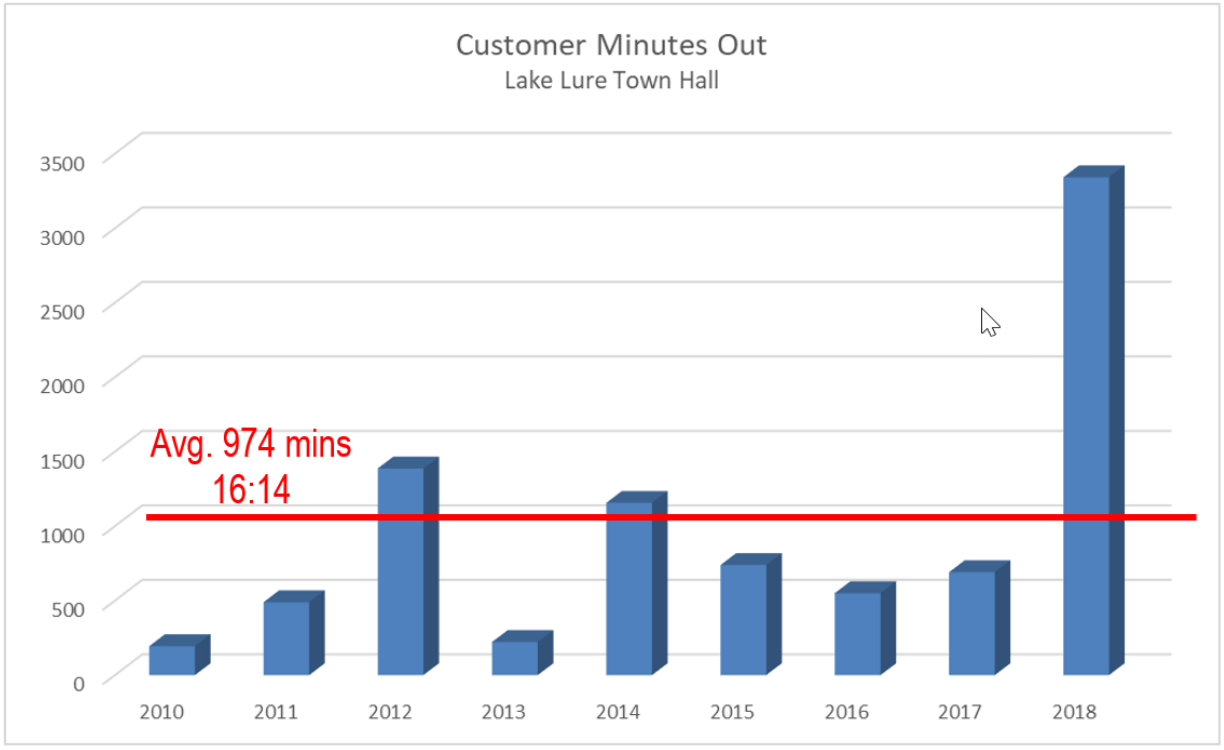
- The Duke Energy management team is very much engaged in service reliability to the Lake Lure area
- The terrain in Duke's Mountain Zone presents unique challenges that negatively impact reliability. This problem has been exacerbated in recent months due to record rainfall. Approximately 80'' of rainfall in 2018 verses 40'' for a normal year
- The remoteness of the Lake Lure area presents additional challenges, especially for outage response time. The 'one way in – one way out' for vehicle travel compounds the problems
- Duke encouraged attendees to report 'hazard trees' via their customer service number, which is 1-800-777-9898. Make sure you provide good directions and a good contact number in case they need to follow-up.
- In order to better serve customers in the Mountain Zone, Duke is moving to an enhanced tree trimming cycle that will result in the feeders being trimmed every 7 years instead of the typical 10 year cycle.

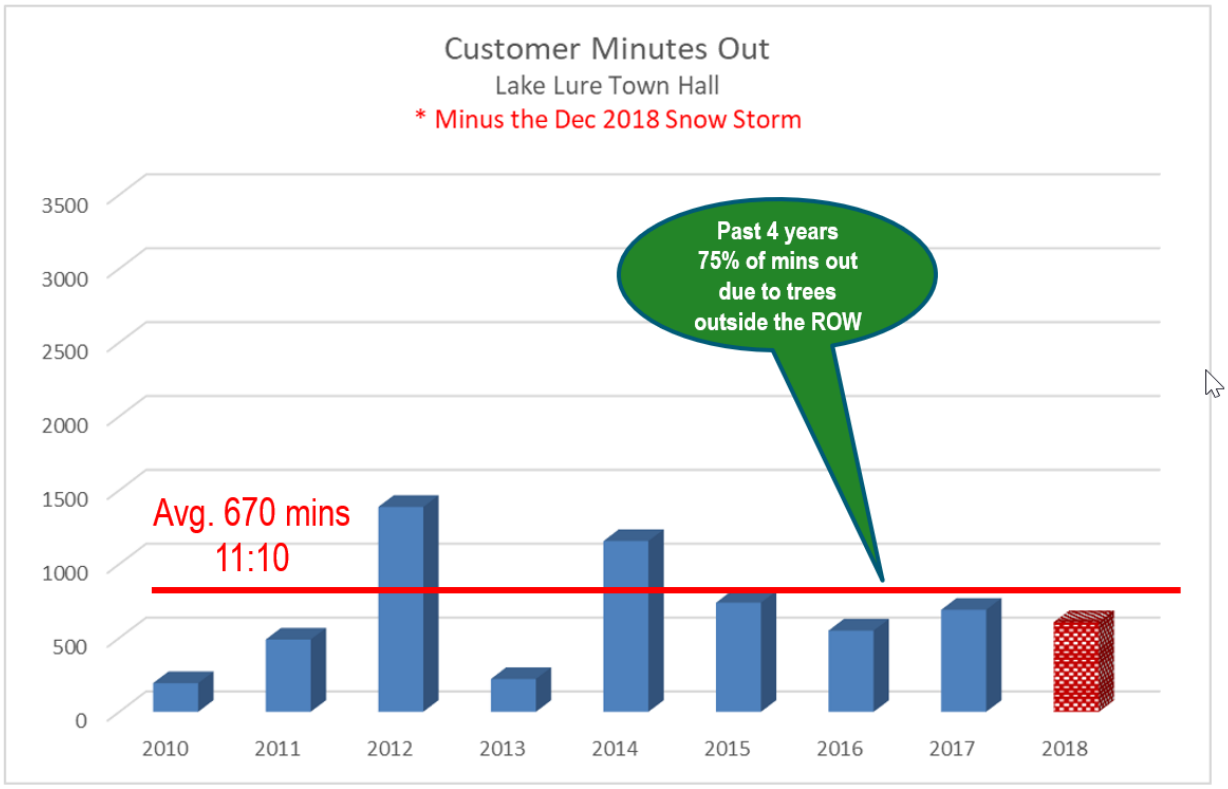
At the close of the meeting Mayor Kevin Cooley expressed his appreciation to Duke Energy for bringing a large number of managers and subject matter experts to listen to residents of the community, answer questions, and discuss measures being undertaken to improve reliability.

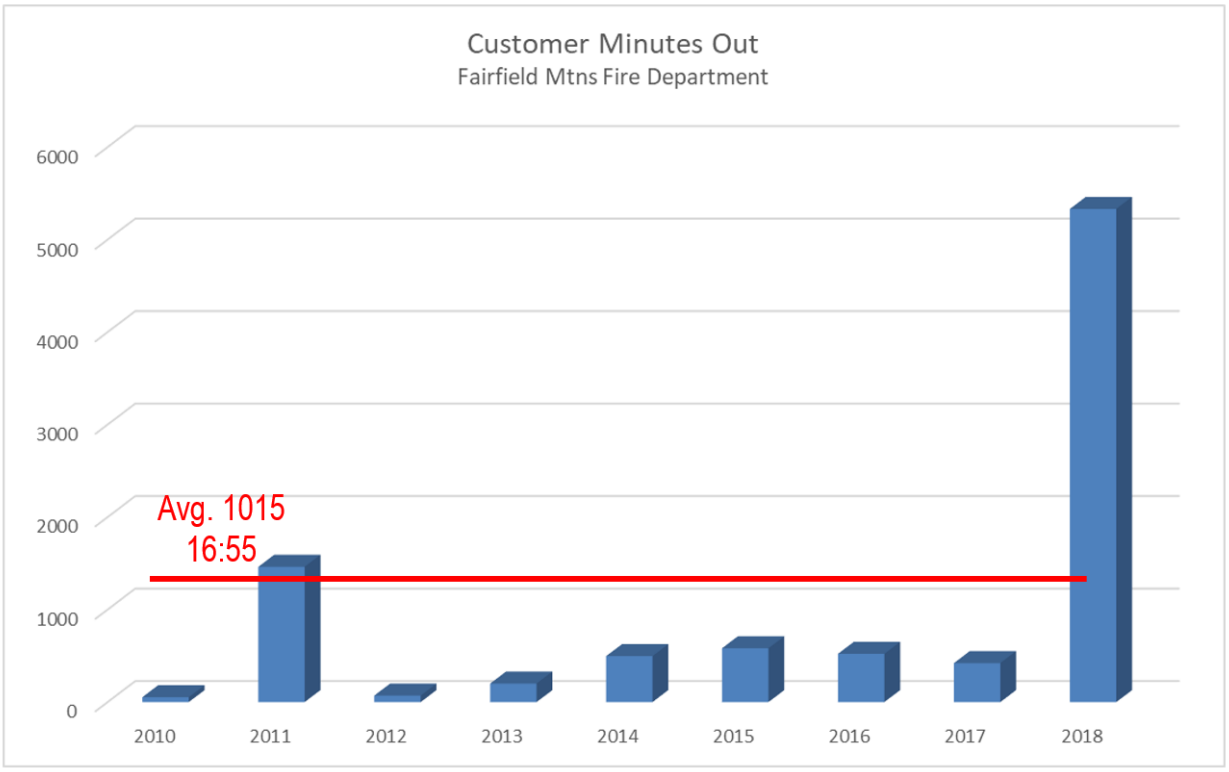
Duke personnel spoke individually with several attendees after the meeting and agreed to follow-up on a number of specific areas of concern.

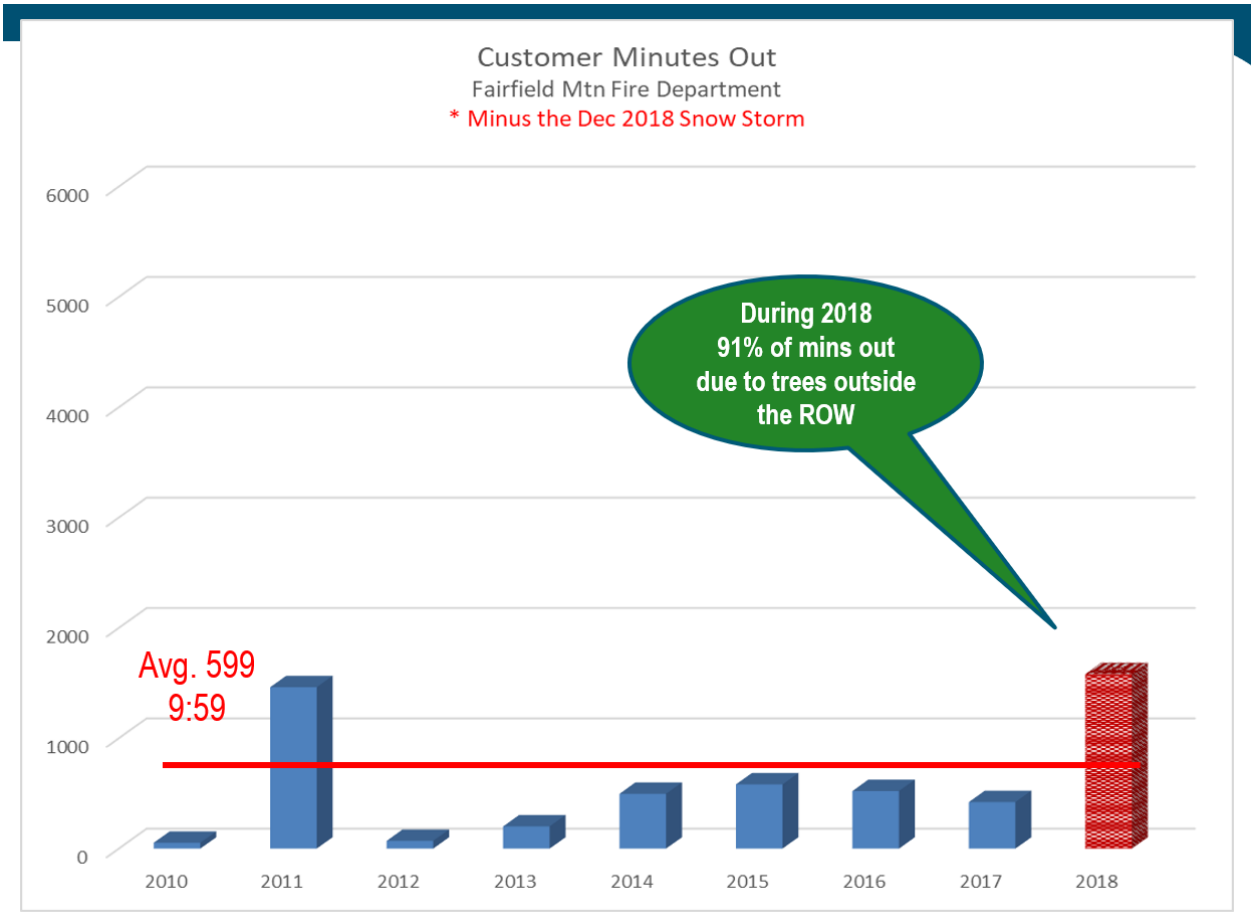
Attendees from Duke Energy
Brain Naumuk, General Manager - Customer Delivery Operations – Mountain Zone
Alton Greene, Manager - Customer Delivery Operations
Sammy Pruett, Supervisor – Construction & Maintenance
Mike Silletti, Manager – Reliability Engineering
Danny Painter, Engineering Technologist
Dena Coker, Sr. Engineering Technologist
Ron Burkhalter, Manager - Distribution Vegetation
Terry Smith, Vegetation Management Specialist
Craig DeBrew, Local Government and Community Relations Manager

Special thanks to Pat Beude, concerned citizen; Shannon Baldwin, Town Manager; and Crag DeBrew, Duke Energy for their coordination in planning this meeting.


Customer Minutes Out
Lake Lure Town Hall
3500
3000
2500
2000
1500
1000
500
0
Avg. 974 mins
16:14
2010
2011
2012
2013
2014
2015
2016
2017
2018


Customer Minutes Out
Lake Lure Town Hall
* Minus the Dec 2018 Snow Storm
3500
3000
2500
2000
1500
1000
500
0
Past 4 years
75% of mins out
due to trees
outside the ROW
Avg. 670 mins
11:10
2010
2011
2012
2013
2014
2015
2016
2017
2018


Customer Minutes Out
Fairfield Mtns Fire Department
6000
5000
4000
3000
2000
1000
0
Avg. 1015
16:55
2010
2011
2012
2013
2014
2015
2016
2017
2018


Customer Minutes Out
Fairfield Mtn Fire Department
* Minus the Dec 2018 Snow Storm
6000
5000
4000
3000
2000
1000
0
During 2018
91% of mins out
due to trees outside
the ROW
Avg. 599
9:59
2010
2011
2012
2013
2014
2015
2016
2017
2018