# APEX

NORTH CAROLINA


November 21, 2024

# Council Work Session

## Electric Rate and Load Management Program Updates

APEX
NORTH CAROLINA

## AGENDA

**Rate Policy**

- Time-of-Use Rate Implementation

**Load Management**

- Load Management Program Changes
- Ordinance Update

# Time-of-Use Rate Implementation

**Overview**

1. Effective means for the Town to reduce it's energy consumption during times of increased demand to the local grid (peak times).
2. Encourages customers to limit usage during on-peak times by offering a lower rates during off-peak times.
3. On-Peak rates typically occur from 6-9 a.m. during the winter and 6-9 p.m. during the summer.
4. In place at other Utility's in the area.

# How “On-Peak” Impacts the Town

- Definitions:
  - Demand: The peak amount of power(kW) used at a given time
  - Energy: The amount of power used over time (kWh)
  - Coincident Peak (CP): The highest average demand for the Town during the hour when the demand is greatest on Duke Energy’s system each month
- The Town’s power bill based on a both an energy charge and a CP Demand charge
  - Demand Charge $22.20/kW
  - Energy Charge  $0.02514/kWh
- The Town’s demand charge is between 50%-66% of the total bill(2-4M per month)

# TOU BENEFITS

- Helps reduce load on local and national grid reducing the need for energy providers to run additional power plants to keep up with demand.
- Saves the Town money on the monthly power bill.
- Helps reduce the cost to customer.
- Reduces the amount of reserve capacity needed by the Town's grid.

# Need for Time-of-Use Rate Implementation

- Impact of EV chargers
  - Large load
    - Level 1: 1.4 to 1.9 kW
    - Level 2: 2.5- ~19.2 kW (a 2.5 ton AC unit is ~2.4kW)
    - Level 3: 50kw+ (Commercial 3 phase applications)
  - Becoming more prevalent
- Time-of-Use will lessen impacts by adjusting behavior
  - Charging EV overnight, setting the delayed charge times found on most EV chargers
  - Washing and drying clothing outside of on-peak hours
  - Adjusting thermostats based on on-peak times
  - Preparing food outside of on-peak times

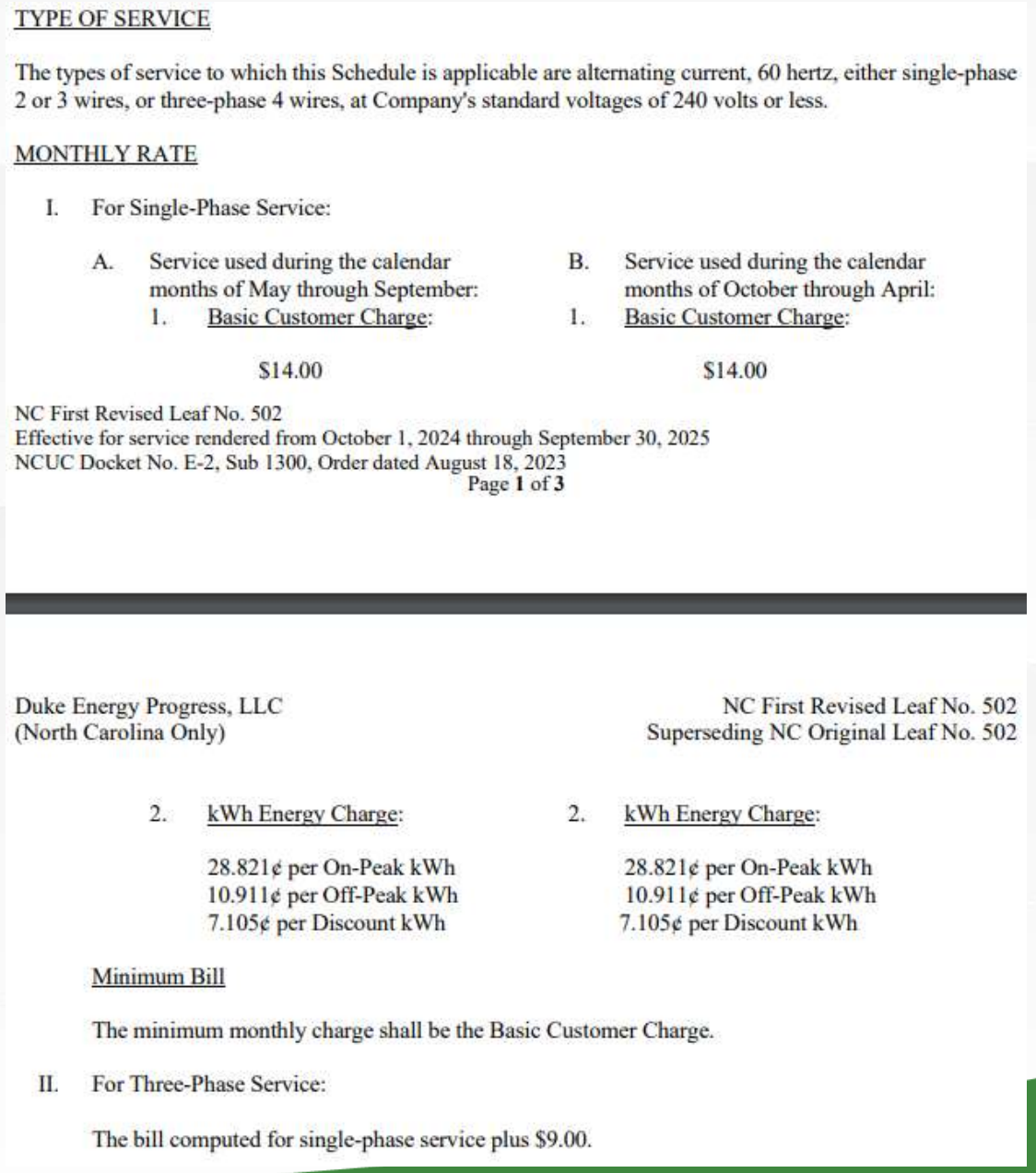
# Proposed Time-of-Use Rate Implementation

- Proposed rate times (to be verified after rate study)
  - Summer months 6-9 p.m.
  - Winter months 6-9 a.m.
- Time frame for implementation
  - After completion of AMI meter replacement (anticipated by December 2025)
- Commercial versus residential Implementation
  - Required for residential (optional for commercial)

# Time-of-Use Rates at other Utilities

## Duke Energy

- Offers non-TOU Rates and multiple TOU rate schedules. One includes notified "critical peak days" where on-peak rates increase 186%
- On-Peak Periods
  - Summer 6:00-9:00pm
  - Winter 6:00-9:00am
- Discount Periods
  - Summer 1:00-6:00am
  - Winter 1:00-3:00am, 11:00am-4:00pm
- Include Riders on most of their rate schedules which may change a customers bill (the example on the right has 8)



TYPE OF SERVICE

The types of service to which this Schedule is applicable are alternating current, 60 hertz, either single-phase 2 or 3 wires, or three-phase 4 wires, at Company's standard voltages of 240 volts or less.

MONTHLY RATE

I. For Single-Phase Service:

A. Service used during the calendar months of May through September:
1. Basic Customer Charge:

$14.00

B. Service used during the calendar months of October through April:
1. Basic Customer Charge:

$14.00

NC First Revised Leaf No. 502
Effective for service rendered from October 1, 2024 through September 30, 2025
NCUC Docket No. E-2, Sub 1300, Order dated August 18, 2023
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Duke Energy Progress, LLC
(North Carolina Only)

NC First Revised Leaf No. 502
Superseding NC Original Leaf No. 502

2. kWh Energy Charge:

28.821¢ per On-Peak kWh
10.911¢ per Off-Peak kWh
7.105¢ per Discount kWh

2. kWh Energy Charge:

28.821¢ per On-Peak kWh
10.911¢ per Off-Peak kWh
7.105¢ per Discount kWh

Minimum Bill

The minimum monthly charge shall be the Basic Customer Charge.

II. For Three-Phase Service:

The bill computed for single-phase service plus $9.00.

# Time-of-Use Rates at other Utilities

## Fayetteville Public Works

- TOU Rate is the only available option to customers
- No “discount” period
- Lower rates with higher base charge

**MONTHLY RATE**

| | |
|---|---|
| **Basic Facilities Charge*** | |
| **Single Phase Service Charge** | **$23.00** |
| **Three Phase Service Charge** | **$28.75** |
| **Energy Charge** | |
| **All kWh On-Peak Hours:** | **$0.14042 per kWh** |
| **All kWh Off-Peak Hours:** | **$0.09152 per kWh** |

**DEFINITION OF PEAK PERIODS**
Peak period is defined as daily (excluding Saturdays, Sundays, and Holidays)

1. On-Peak Hours:

| | | |
|---|---|---|
| Summer: | (April-October) | 3:00 PM to 7:00 PM |
| Non-Summer: | (November-March) | 6:00 AM to 10:00 AM |

2. Off-Peak Hours: All other hours other than On-Peak Hours.

3. All holiday and weekend hours are deemed to be Off-Peak Hours.

**POWER SUPPLY ADJUSTMENT (PSA)** All stated rates are subject to a monthly power supply adjustment (PSA).

**COAL ASH RIDER** As specified in the Service Regulations and Charges, a monthly surcharge to recover the portion of Duke Energy Progress’ cost of cleaning up coal ash that is allocated to PWC.

| | |
|---|---|
| **Coal Ash Rider** | **$2.00** |

# Time-of-Use Rate Comparison with other Utilities

| Utility | Base Charge | On-Peak Rate | Off-Peak Rate | Summer Peak Hours | Winter Peak Hours |
|---|---|---|---|---|---|
| Duke Energy | $14.00 | 28.821¢ / kWh | 10.911¢ / kWh* | 6:00pm – 9:00pm | 6:00am – 9:00am |
| Fayetteville PWC | $23.00 | 14.042¢ / kWh | 9.152¢ / kWh | 3:00pm – 7:00pm | 6:00am – 10:00am |
| Apex (not in use)** | $26.50 | 23.45¢ / kWh | 6.23¢ / kWh | 1:00pm – 6:00pm | 6:00am – 9:00am |

*Duke offers 7.105 ¢ / kWh rate during “discount hours” 1-6am in summer months, 1-3am and 11am to 4pm in winter months.

**This is the old TOU rate that Apex has but is not offered. This rate includes 3 additional peak hours during the first fifteen days of shoulder months (April and October).

# Load Management

**Overview**

1. Load management devices need to be upgraded if the program is to continue.
2. There are changes to the program's ordinance that should be implemented to increase efficiency and clarify the Town's requirements for the program.
3. The Load management program remains a viable and effective means for the Town to reduce it's energy consumption during times of increased demand to the local grid.

# Load Management Program Summary

- Program helps reduce the Town's total electric usage during peak or high-demand hours
- Briefly cycles off the largest electric appliances in homes to reduce the aggregate usage
  - HVAC Unit heat pumps and compressors
  - Water Heaters
  - Heat Strips
- The Town has provided the Load Management switches for new construction since the programs inception
- Participation is optional
- Customers can select the level of participation for HVAC unit control
  - 25%
  - 50%
  - 100%
- Customers were given credits based on their level of participation

# Load Management Program Status

- Since the inception of the program in the mid 90's over 20,000 load management switches have been installed in the Town. The exact number is unknown due to loss of records over the decades.
- Number of switches currently Installed*

LCR-2000 – ~3400 – Prior to 2006

LCR-2000 – 600 – 2004 to 2006

LCR-5000 – 4,254 – 2006 to June 2013

LCR-5600 – 14,296 – June 2013 to 2023

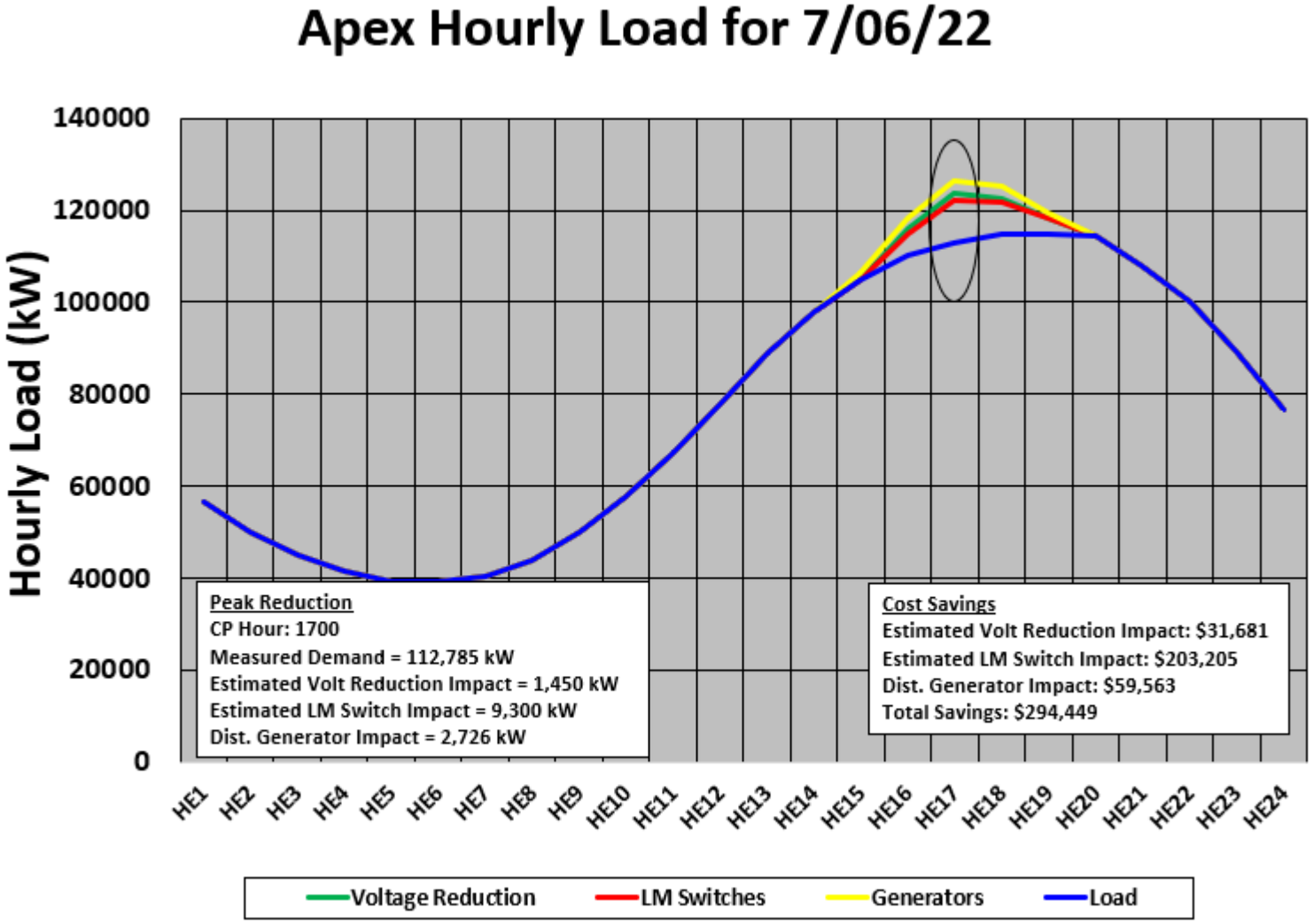
Total: 22,550

*LCR-2000 quantities are assumed, all other quantities were provided by the Manufacturer from their records

It is estimated that only 40-50% of these switches are currently operational

# Load Management Program Savings

- Varies based on the month
  - Average $200,000 per month
  - Higher during the summer when there is more demand
- ElectriCities estimated savings to be $1.8 million in 2022
- Estimated $2.45 million/year with new system
- Annual Costs (new system)
  - Hosting costs $25,000
  - Cellular cost $1.00/device
  - Costs have 4% yearly escalation



# Load Management Switch Degradation

- LCR 2000 models have been non-operational for a number of years because they were based on radio frequency technology, which has been abandoned
- The LCR 5000 and 5600 devices utilize paging signals that are slowly losing coverage as the technology is being obsolesced
- HVAC technician often bypass the switches when diagnosing problems and never reconnect the switch
- Age, some existing switches have been in service for 25+ years

# New Load Management Switch

- Has two-way communications allowing the utility to monitor the devices status and confirm functionality
- Will decrease the number of bypassed switches on the system
- Will be easier to maintain and can send trouble alarms
- Pay off time is 4 -6 years
- Life expectance 15-20 years

# Load Management Proposed Ordinance/Administration Changes

- Remove credits for those participating the program
- Incentivize participation in the program by having a higher rate for those who choose not to participate
- Removal of the 50 and 100% participation level options (only 25% control will be used)
  - Few residents choose these participation levels, and their removal will simplify billing and system management
- Clarification of the customer's responsibility to maintain building wiring
- Requirement of installation of load management devices on new construction and permits over $10,000

# Load Management Proposed Infrastructure Upgrades (CIP Projects)

| | FY 25-26 | FY 26-27 | FY 27-28 | FY 28-29 | FY 29-30 |
|---|---|---|---|---|---|
| Professional Services | $600,000 | $600,000 | $600,000 | $600,000 | $600,000 |
| Equipment | $965,000 | $965,000 | $965,000 | $965,000 | $965,000 |
| Totals | $1,565,000 | $1,565,000 | $1,565,000 | $1,565,000 | $1,565,000 |

**CIP Project Main points:**

- The majority of the LCR 2000s are to be replaced in FY 25-26, subsequent years will replace the remaining LCR 5000 & LCR 5600s
- Number of replacements per year (~5000) and costs will be adjusted as the projects progress
- Cost of Professional services is estimated based on current labor rate averages, and the assumed 5,000 device
- Service contract could be extended to help maintain the system yearly to lesson the need for additional town personnel

# Thank you

# Strategic Goal Icons

The icons below can be used to illustrate a connection between your content and our five strategic goals

A Welcoming Community

High Performing Government

Environmental Leadership

Responsible Development

Economic Vitality