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December 18, 2023

VIA ELECTRONIC FILING

Ms. Shonta Dunston, Chief Clerk
North Carolina Utilities Commission
4325 Mail Service Center
Raleigh, NC 27699-4300

**Re: CUCA Presentation Materials for 2023 Mechanism Review
Technical Conference
*Docket Nos. E-2, Sub 931; E-7, Sub 1032; and E-100, Sub 179***

Dear Ms. Dunston:

Attached for filing on behalf of the Carolina Utilities Customer Association (“CUCA”) in the above-referenced dockets is the presentation of Dr. Stephen Terry.

Please do not hesitate to contact me should any questions arise in connection with this filing.

Sincerely,

BROOKS, PIERCE, McLENDON,
HUMPHREY & LEONARD, LLP

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cc: Parties of Record

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Dec 18 2023

Industrial DSM/EE Perspectives

Dr. Stephen Terry, PE

Technical Director, CUCA

Associate Professor Emeritus, NC State University

My Background

- Currently Technical Director for CUCA
- Emeritus Professor in Mechanical Engineering, NC State
 - NCSU Industrial Assessment Center 1992 – 2022
 - NC Energy Management Program, through NC Energy Office
 - Performed over 700 industrial assessments in NC, SC, VA
 - US Dept of Energy Steam Expert, performing assessments at large sites around the country
 - Over 25 years of teaching experience including industrial energy efficiency, HVAC, thermal systems design

DSM/EE: The Industrial Perspective

- DSM & EE programs serve distinct but related purposes.
- In contrast to other customer classes, Industrial customers have highly specialized needs - which is reflected in the statutory opt-out from “one-size-fits-all” DSM/EE programs.
 - Ability to curtail loads and respond to price signals varies widely.
 - Highly incented by market forces to operate in the most efficient manner possible.
 - The driver of efficiency is typically the specific industrial process in issue – not things like lighting and HVAC.
 - Utilities lack the expertise to design efficient industrial processes.
 - Trade secret confidentiality concerns.

Example: Industrial Perspective on EE Rider

- The EE Rider and Smart\$aver programs were created to incentivize implementation of energy efficiency measures.
- Incentives are specified for many common energy-consuming devices/processes like lighting, compressed air, HVAC.
- Custom incentives for projects not fitting the prescribed list.
- Participation requires being subject to the applicable EE Rider.
 - DEP - \$0.00424 per kWh
 - DEC - \$0.006242 per kWh

Source: DEC – 58th Summary of Riders, eff 9/1/2023
DEP – Summary of Rider Adj Leaf 600, eff 12/1/2023

Example: Industrial Perspective on EE Rider

- EE Rider costs for a residential customer is about \$50 per year.
- Because the rider is a volumetric assessment, EE rider charges vary greatly for industrial customers.

Size	Demand, kW	Energy, kWh	DEP EE Rider	DEC EE Rider
Small	500	2.3 million	\$10,000	\$14,000
Medium	2,000	10 million	\$42,000	\$62,000
Large	20,000	150 million	\$636,000	\$936,000

- For many CUCA members the rider cost would be substantially more.

Example: Industrial Perspective on EE Rider

- Being “opted in” means needing to collect at least that much in incentives each year, or losing money.
- Typical incentives:
 - Fluorescent Office Lighting to LED, \$20 per fixture
 - New VFD Air Compressor, \$82.50 per hp
 - VFD for Pumping System, \$40 per hp
- A medium sized industrial plant would have to upgrade 2,500 light fixtures or install 600 hp of new VFD compressor capacity to make use of the incentives, EACH year.
 - Lights would cost about \$15-\$20 per lamp
 - 100 hp VFD air compressor, at least \$60,000

Prescriptive Rebates for NC from SmartSaver web-site, DEP, retrieved 12/11/2023

Prices from Grainger.com

Example: Industrial Perspective on EE Rider

- Facilities are **ALREADY** doing projects without incentives
 - My 1 year implementation rate was about \$30,000 - \$40,000 saved per plant per year for small/medium sized plants.
- Current incentives cover major energy users in residential and some commercial but not at many large industrial.
 - The per kWh charge is inconsistent with benefits since only a portion of the energy end use systems are covered and the costs to improve production equipment is in the millions
- The program works for some facilities – mostly very small, or those that carefully plan their capital investments.