

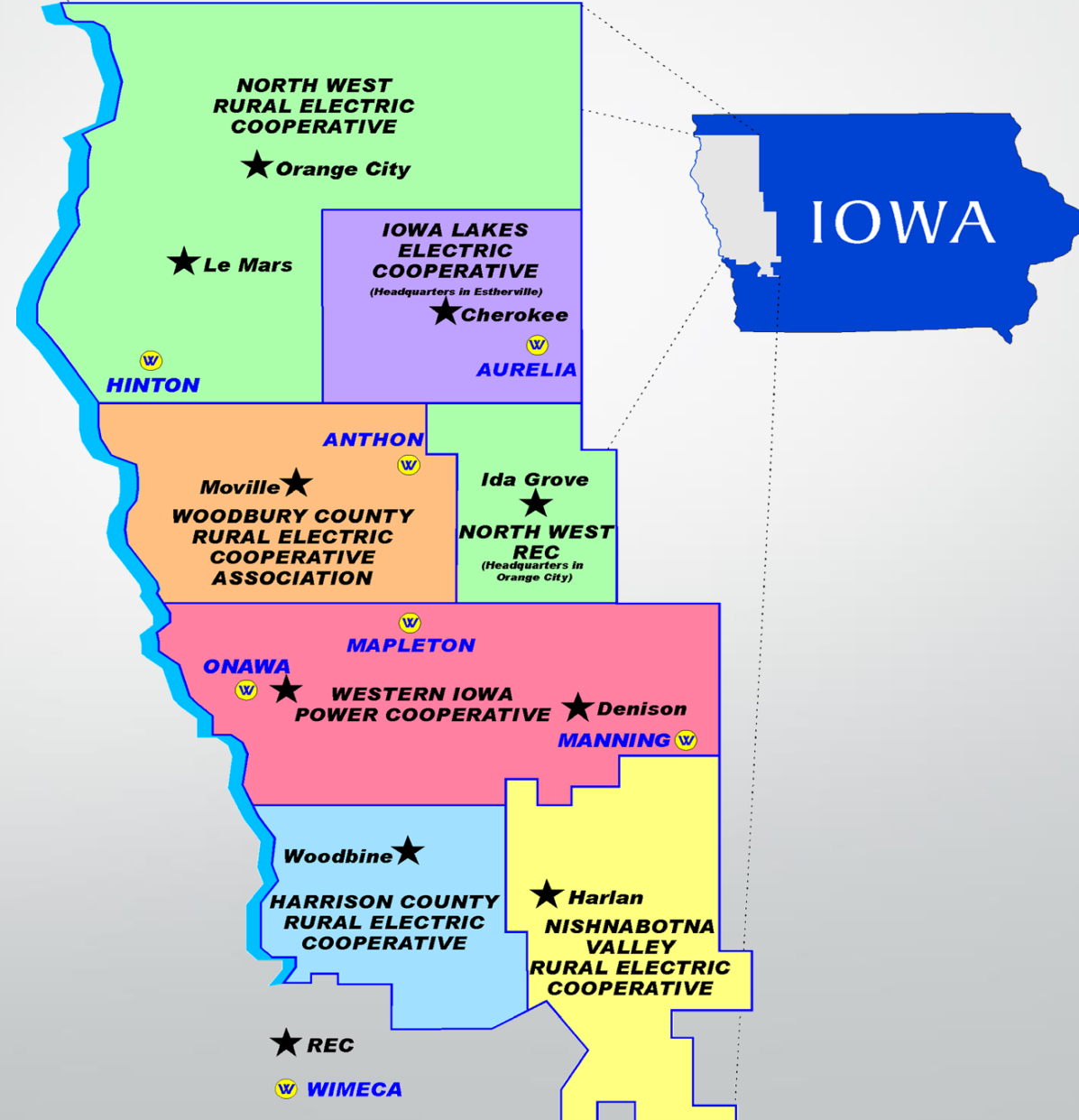


NIPCO Battery Project

February 1, 2024

Member Cooperatives of the NIPCO System

- NIPCO is a transmission Cooperative with six REC members and one Municipal member.
- NIPCO owns the transmission lines and substations.
- The RECs and Municipals operate at the distribution level and serve the consumers – approximately 30,000 meters.
- Purchased power supply:
 - ✓ 80% from Basin (Mixed Blend)
 - ✓ 20% from Western (Hydro)



NIPCO Battery Project



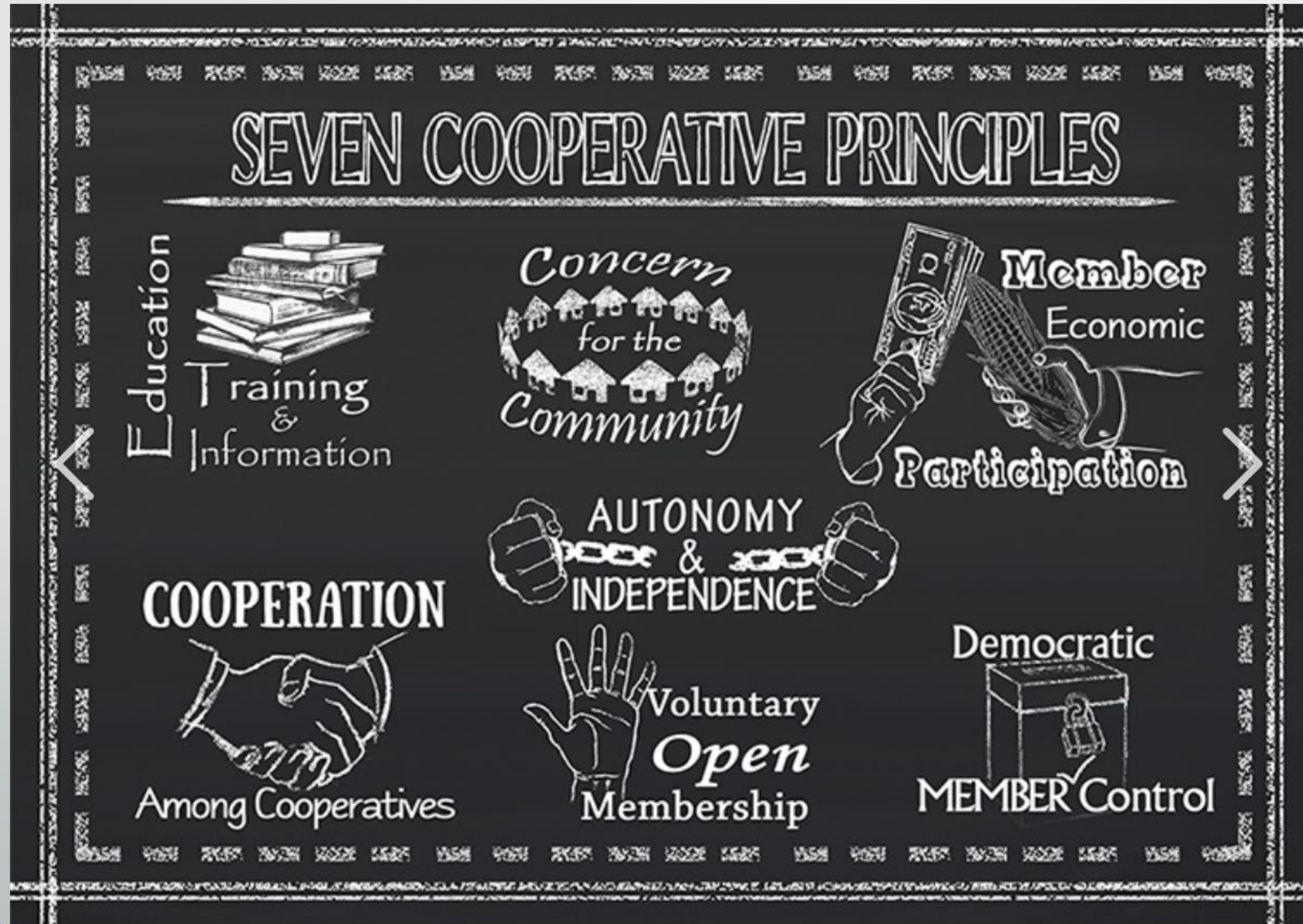








NIPCO Battery Project



2024

CLASS A
MEMBER RATE
SCHEDULE

RATE SCHEDULE A MEMBER OWNED TRIAL BATTERY RATE

Allows the Class A or Class C Members (Members) to own batteries to incorporate the batteries into their load management control program if the Member desires. This rate is limited to new applications received for calendar year through 2025. The application will identify the anticipated term of applicability.

Eligibility Criteria

1. Batteries under this Rate will be charged and discharged per the Members direction.
2. The batteries must be located within the Member's service territory.
3. The Member needs to site the battery below the BEPC point of delivery and the total battery output level cannot exceed the load level on that portion of the system.
4. For batteries that are interconnected to the electrical grid, the batteries must meet the following requirements:
 - a. The Member shall be responsible for all interconnection costs and agreements required for operation of the batteries interconnected with the electrical grid.
 - b. Operation of the batteries must comply with any applicable "Behind the Meter" transmission system policy.

Note: The application, study and approval process to obtain approval for interconnection and transmission service, entails considerable time, effort and cost. The Member is encouraged to consult with Basin Electric Resource Planning Staff prior to committing to this process. It would be Basin Electric's intent to net the battery discharge with the local area load so SPP interconnection and generation reporting would likely not apply.

5. Under the all-requirements contract; BEPC is assuming that battery discharge is a generation source and as a result BEPC will deem the battery discharge output under this rate schedule as a BEPC point of delivery. For purposes of implementing this rate, BEPC recognizes that the battery charging and discharging cycle does not diminish BEPC energy sales to the Member and as it is the intent to allow the Members to reduce their demand purchased by the discharge of the batteries. As a result BEPC does not believe the battery discharge meter reads need to be considered in the BEPC Member Billing process as long as the battery discharge is behind a BEPC delivery point down on the Members distribution system.
6. MV90 time registration metering or a comparable form of data submittal recording the charging and discharging of the battery would be requested for informational and analysis purposes.
7. Each All-Supplemental Requirements Member will be allowed to own and operate batteries, up to the amount specified below, within their Member's system. The magnitude listed below have been determined based on 150 kW of batteries for each Distribution Cooperative within their Member service territory. If the Distribution Cooperative is within two Class A Members service territories there is an allocated amount of 75kW within each Class A Members. The Table below lists the amount for each Member.



2024

CLASS A MEMBER RATE SCHEDULE

Load Determination

The Basin Electric monthly demand billing units shall be based upon the highest 30 minute integrated demand (or corrected to a 30 minute basis in the event where 15 minute demand registers are installed) plus Basin Electric power purchased from the Members under the attached purchase rates as applicable, measured outside of the Base Rate Demand Waiver period listed below. **Basin Electric will maintain the Demand Period Waiver Rate through 2026; and it is Basin Electric's Board's intent to maintain the Demand Period Waiver through 2028,** unless the impacts of the Demand Period Waiver results in Basin Electric needing to add additional Generation Capacity.

Base Rate Demand Period Waiver	
Month	Base Rate Demand Waiver Period Central Prevailing Time (CPT)
June, July, August, September	10:00 p.m. - 11:00 a.m.
January, February, March, April, May, October, November, December	10:00 p.m. - 6:00 a.m. & 11:00 a.m. - 5:00 p.m.



**Iowa Lakes
Electric Cooperative**

The Power of Many, Working as One!
A Touchstone Energy® Cooperative 



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SWITCH MAKES CENTS

LOAD MANAGEMENT PROGRAM



SWITCH MAKES CENTS

LOAD MANAGEMENT PROGRAM

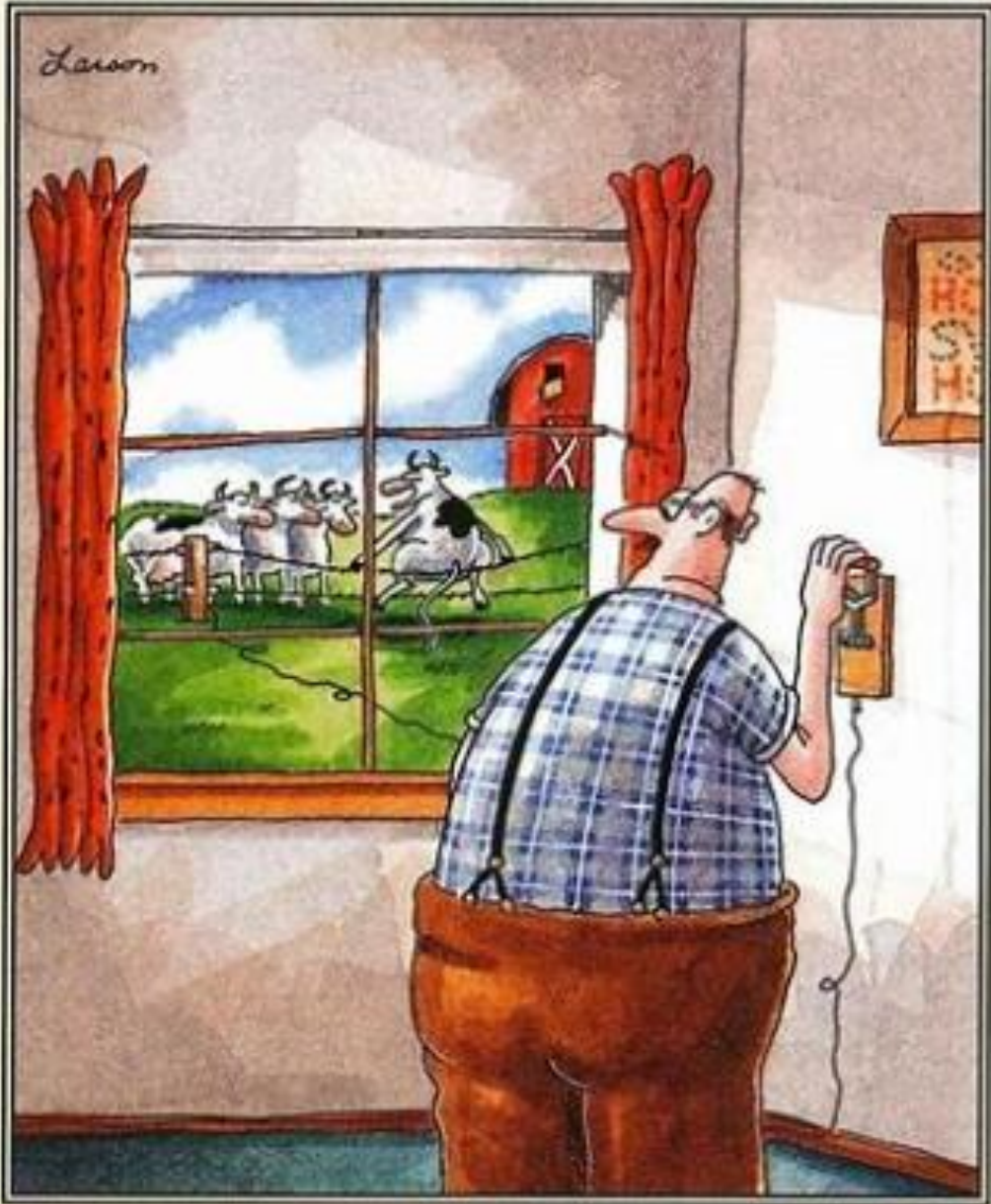
- NIPCO started load management program in 1985, to sell excess power during the farm crisis...
- Approximately 19,000+ switches in the field controlling water heaters, HVAC, irrigators and member-owned generators to reduce monthly peak demand.
- NIPCO can shed up to 20MW in the summer and 12MW in the winter.
- The load management program saves NIPCO members approximately \$3.7M annually.

Load Management Incorporation

- Plan to utilize battery storage as part of load management strategy.
- 6-hour duration, 1.3MW maximum charge battery.
- Due to large addition of load reduction, requires longer run-time than generators.
 - Will then flatten secondary peaks before and after coincident peak.
- Scheduled to charge during Basin Waiver Periods, as close to the anticipated discharge as possible to avoid energy losses. This is determined based on weather forecasts.
- Strategy incorporated into NIPCO SCADA, discharge automatically occurs when our total load get to within 1 MW of our daily set point.

2/24/93

Larson



“Look, if it was electric, could I do this?”

Lawton Substation

- MAPS
- MAPBOARD
- LINE SECTION
- Location, REC, NIPCO Crew, Sheriff

1152 kW 1791 kVA
 -1357 kVar 0.66 PF

Meter

Closed
 100 %

- 0 ALARMS
- ABNORMAL
- DATABASE
- DOOR
- RTU State **ON**

Home

Waiver Status

Waiver Period

Charging Status

Standby **ON** Run **OFF**

Discharge Scheduler

Month Hour
 Day Minute

Use Military Time

TES Auto Discharge **ON**

When TES Auto Discharge is ON it will automatically start discharging battery.

When TES Auto Discharge is OFF operator will need to manually enter in Month, Day, Hour, Minute values

Tesla Site Controller Analogs

Battery Target Power	-100.0 KW
Battery Target Q	0.0 Kvar
Full Charge Energy	5953.0 MWh
Nominal Energy	2976.0 KWh
Full Charge Percentage	47.0 %
Energy Remaining At Full Power	2852.0 MWh
Charge Power	100.0 KW
Charge Time remaining	1.2 HRS
Discharge Time Remaining	0.0 HRS

Tesla Site Controller Status

Batt Meter Comms	Batt Inverter Active
Batt Comms	Minimum Power Limited
Batt Fault	Maximum Power Limited
Batt Unexpected Power	Ramp Rate Limited
Batt Latency	



TESLA Meter

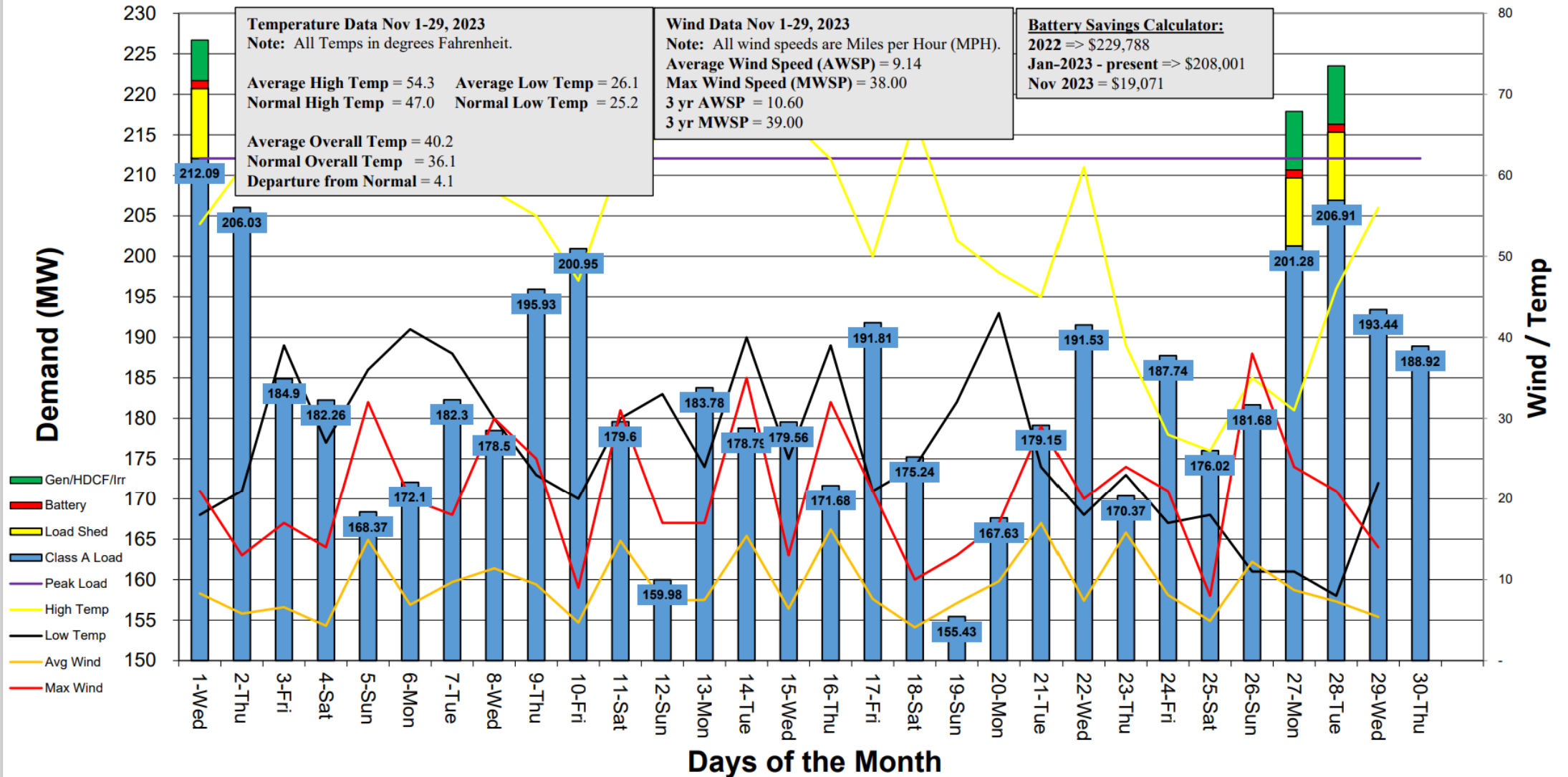
KW	80.5
Kvar	-30.9
Kva	74.2
PF	0.96
IA	3.7
IB	3.8
IC	3.9
VA	124.8
VB	124.7
VC	125.3

RCL 704

KW	84.0
Kvar	-33.0
IA	3.7
IB	3.8
IC	3.9
VA	7435
VB	7544
VC	7509

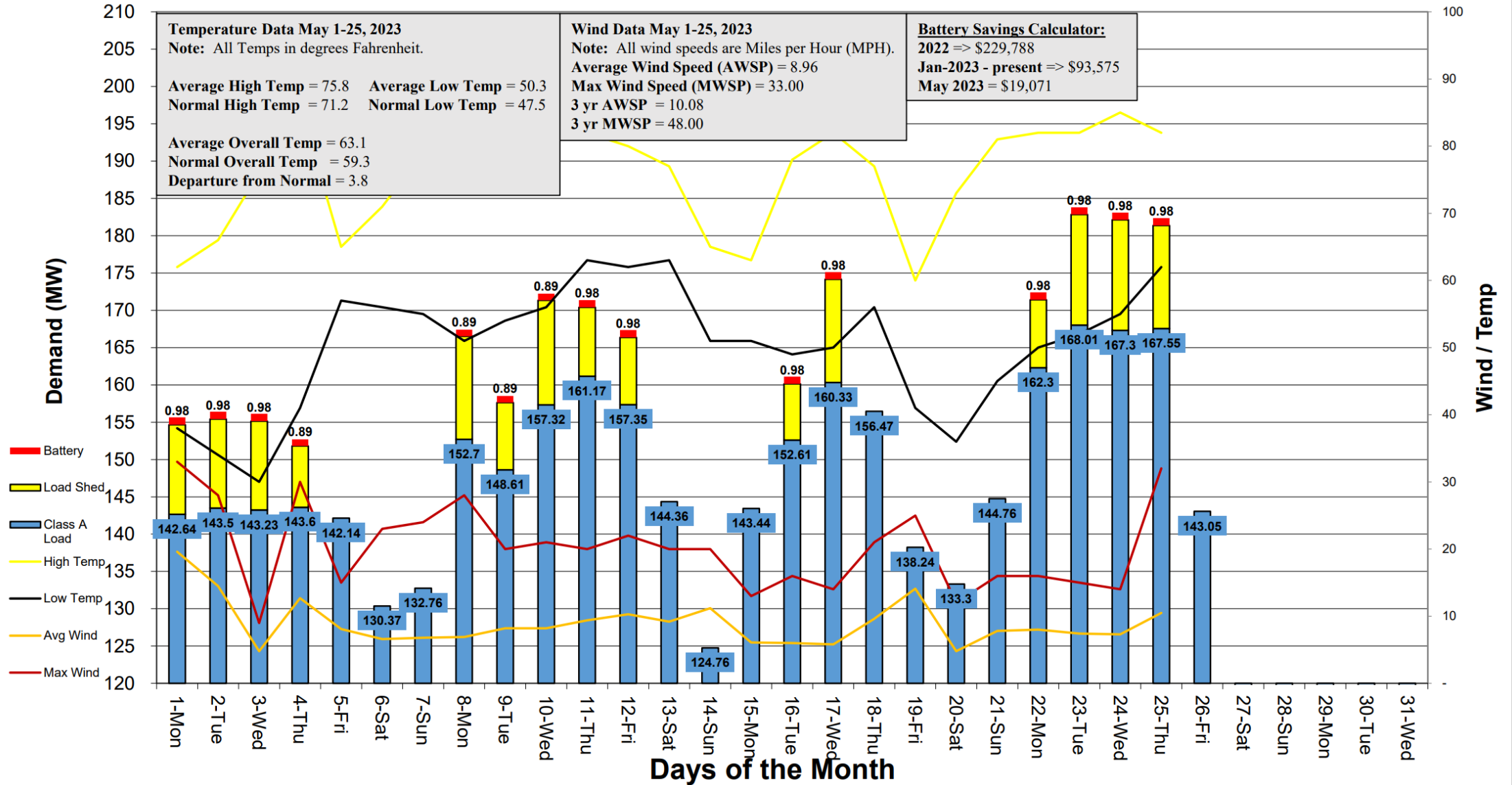
NIPCO November 2023 Load

November 2023 Class A SCADA Data Daily Peaks With Load Control



NIPCO May 2023 Load

May 2023 Class A SCADA Data Daily Peaks With Load Control



NIPCO Battery Project Lessons Learned...

- Estimated savings through 12/2023 - \$400,000
 - 12-year payback, if Basin demand rate stays constant
- Maintenance Plan is a must. Pay the maintenance plan cost, it has paid for itself several times over. Essentially a bumper-to-bumper coverage plan.
- Some people think the battery packs are EV charging stations...
- Battery safety – know which volunteer fire department covers the substation...

NIPCO Battery Project Lessons Shared...



NIPCO Battery Project

- Technology is really expensive...
- Like most all new and emerging technologies in power supply, without extenuating benefits, i.e., all the coops working together, we would have not considered this project, too expensive.



Thank You!!

Questions?