



***Metro Nashville***  
**DISTRICT ENERGY SYSTEM**

*DES Advisory Board Meeting*  
*Third Quarter FY23*  
*May 18, 2023*



# *Agenda*

1. Call to Order
2. Review & Approval of Previous Meeting Minutes
3. Customer Sales
4. Review of DES Contractor Performance
5. Natural Gas Purchasing Update
6. FY23 Costs to Date and Budget
7. Marketing
8. Capital Projects Review & Status
9. Side Stream Filter
10. Other Board Member Items
11. Adjourn

1. Call to Order
2. Review & Approval of Previous Meeting Minutes

## 3. *Customer Sales*

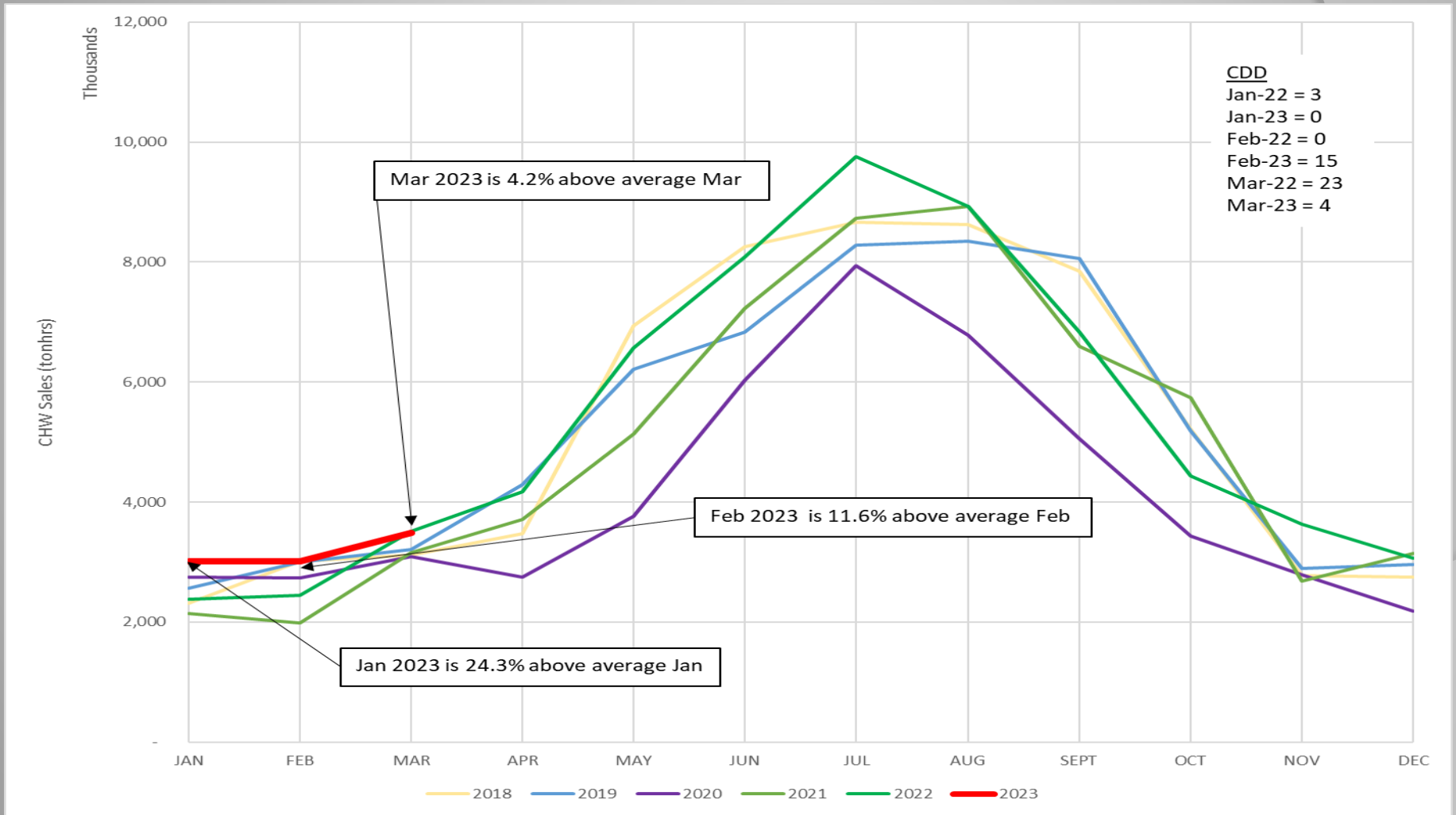
- ❖ There are 5 customers in arrears more than 30 days
- ❖ Table 3: Customer Cost Comparison for the Previous 12 Months
- ❖ Figure 3A: Historic Chilled Water Sales
- ❖ Figure 3B: Historic Steam Sales

## Summary Table 3: Customer Cost Comparison for the Previous 12 Months

		Steam - Rolling 12 Month			Chilled Water - Rolling 12 Month		
		Apr 2021- Mar 2022	Apr 2022- Mar 2023	% Diff.	Apr 2021- Mar 2022	Apr 2022- Mar 2023	% Diff.
<b>Private</b>	Cost	\$ 1,578,881	\$ 1,796,226	13.77%	\$ 4,104,844	\$ 4,627,769	12.74%
	Usage (lbs or tonhrs)	91,262,240	94,042,066	3.05%	21,531,885	23,625,674	9.72%
<b>State</b>	Cost	\$ 2,003,922	\$ 2,307,024	15.13%	\$ 3,316,357	\$ 3,546,793	6.95%
	Usage (lbs or tonhrs)	105,983,296	114,254,268	7.80%	13,582,769	14,445,087	6.35%
<b>Metro</b>	Cost	\$ 1,980,386	\$ 2,290,836	15.68%	\$ 4,661,051	\$ 5,134,396	10.16%
	Usage (lbs or tonhrs)	132,254,216	136,214,341	2.99%	25,409,360	26,913,888	5.92%
<b>Aggregate</b>	Cost	\$ 5,563,189	\$ 6,394,087	14.94%	\$12,082,252	\$13,308,958	10.15%
	Usage (lbs or tonhrs)	329,499,752	344,510,675	4.56%	60,524,014	64,984,649	7.37%
	Unit Cost	\$ 16.88	\$ 18.56	9.9%	\$ 0.200	\$ 0.205	2.59%

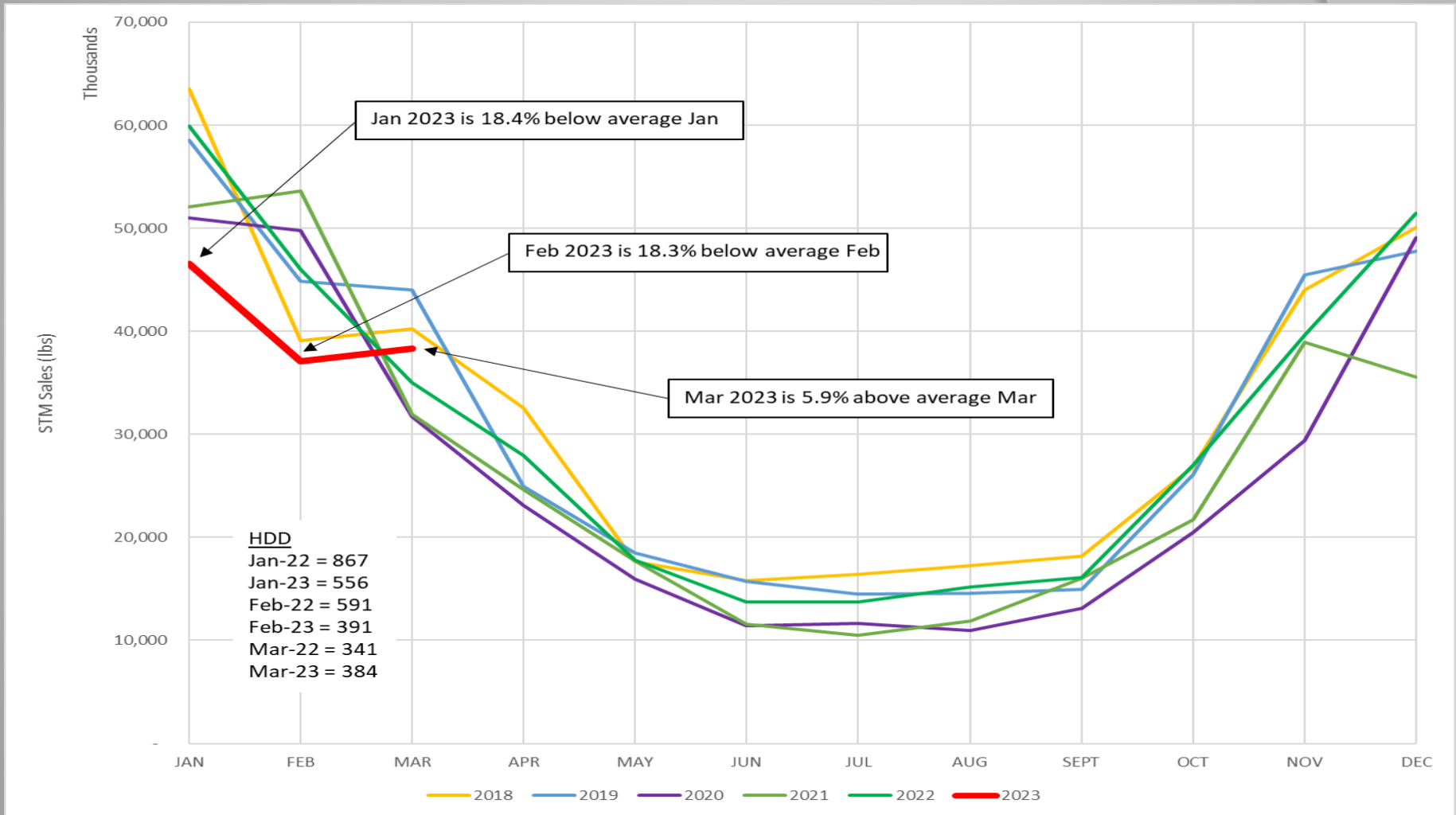
MFA, True-up, late fees and misc. are not included in values shown

# Figure 3A. Historic Chilled Water Sales



Averages include the years 2018, 2019, 2020, 2021, 2022, and 2023.

# Figure 3B. Historic Steam Sales






Averages include the years 2018, 2019, 2020, 2021, 2022, and 2023.



## 4. *Review of DES Contractor Performance*

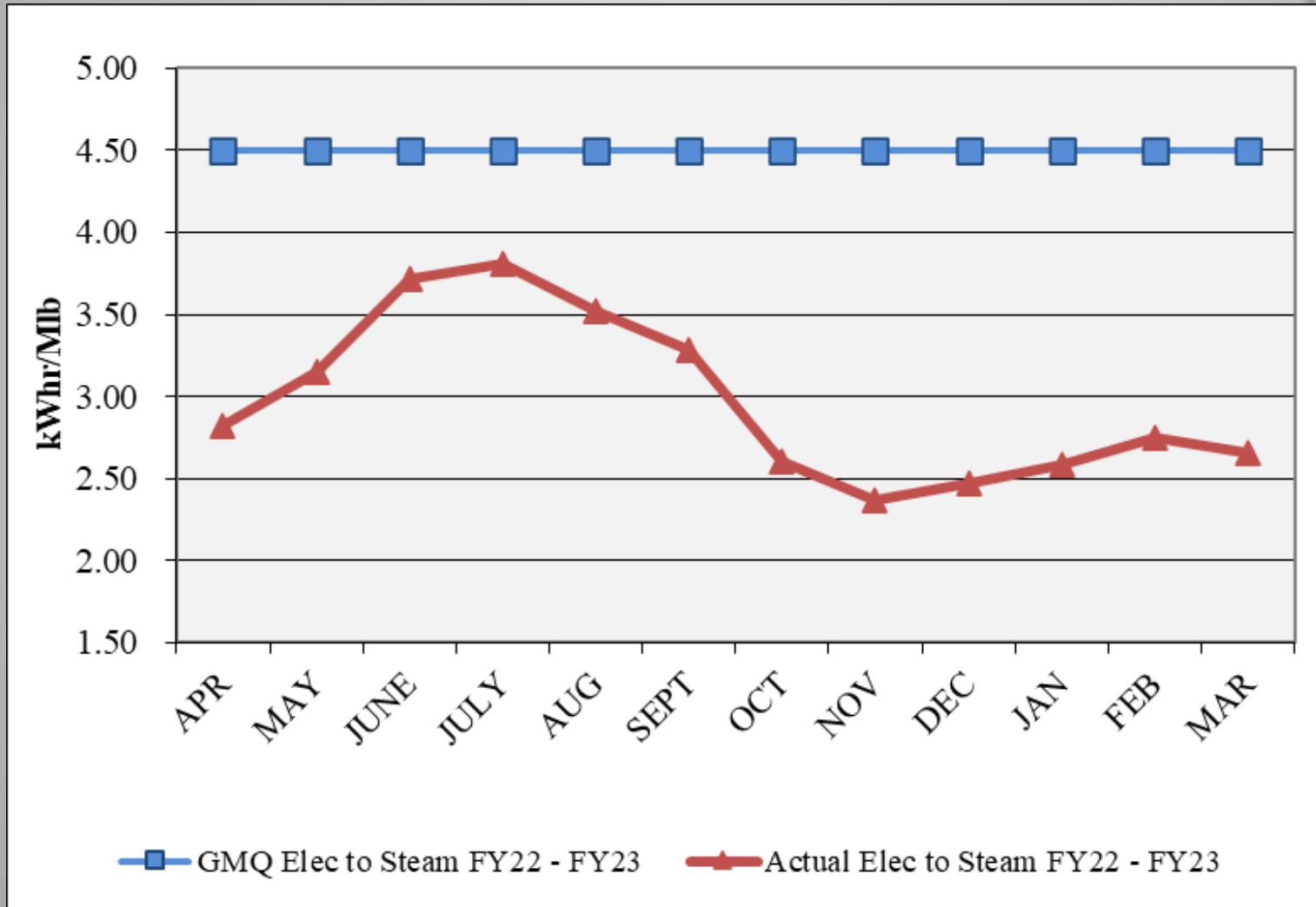
CES has made improvements in FY23 and has more consistently met the performance metrics for Q3. CES continues to address the system energy usage.

CES has several long-term, outstanding maintenance items in EDS tunnels that need to be addressed.

-  Excellent Performance – No Improvement Necessary
-  Satisfactory Performance – Some Improvement Could Be Made
-  Poor Performance – Much Improvement Necessary

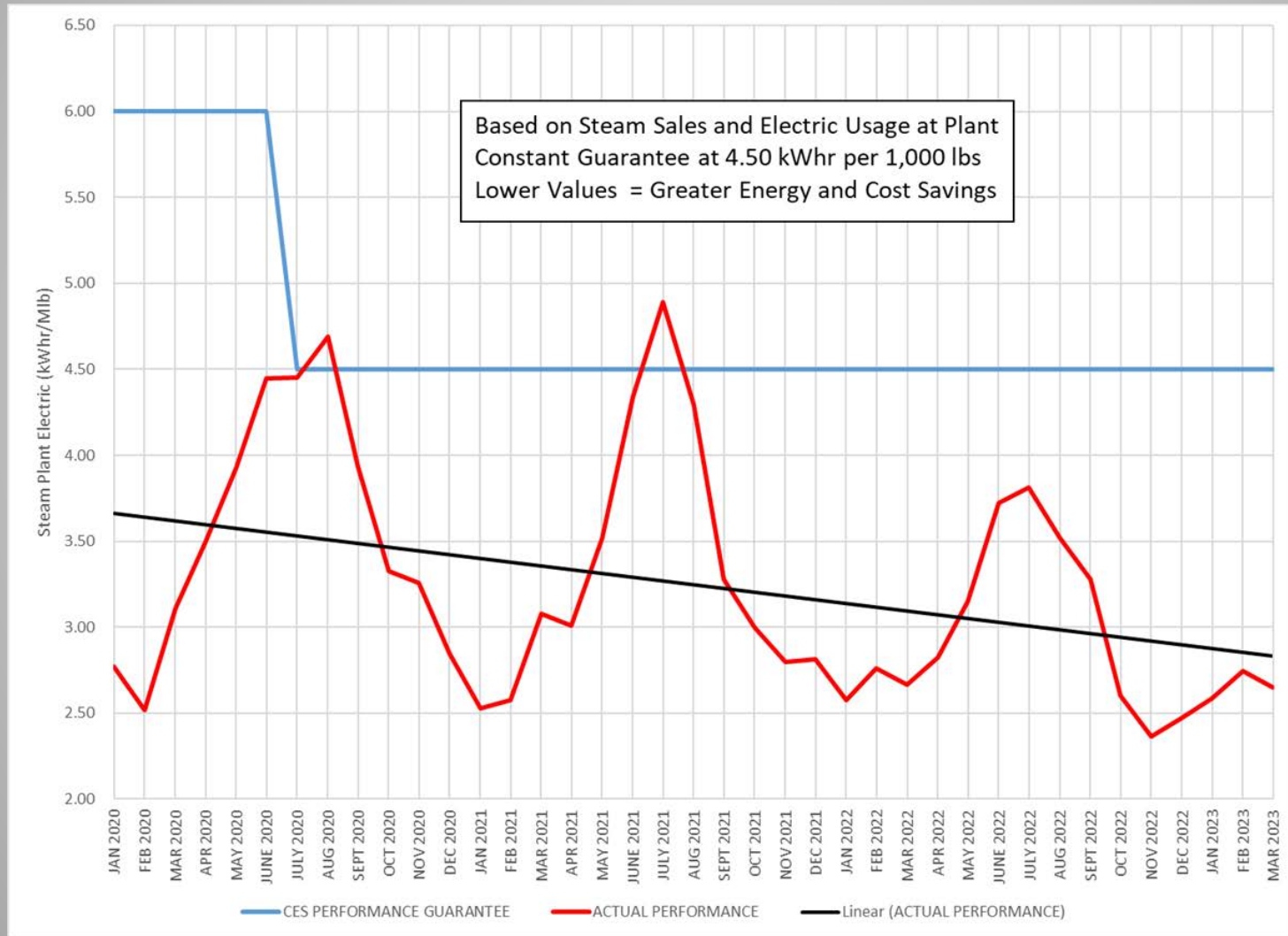


# Performance Measurement FY23: Steam Electric



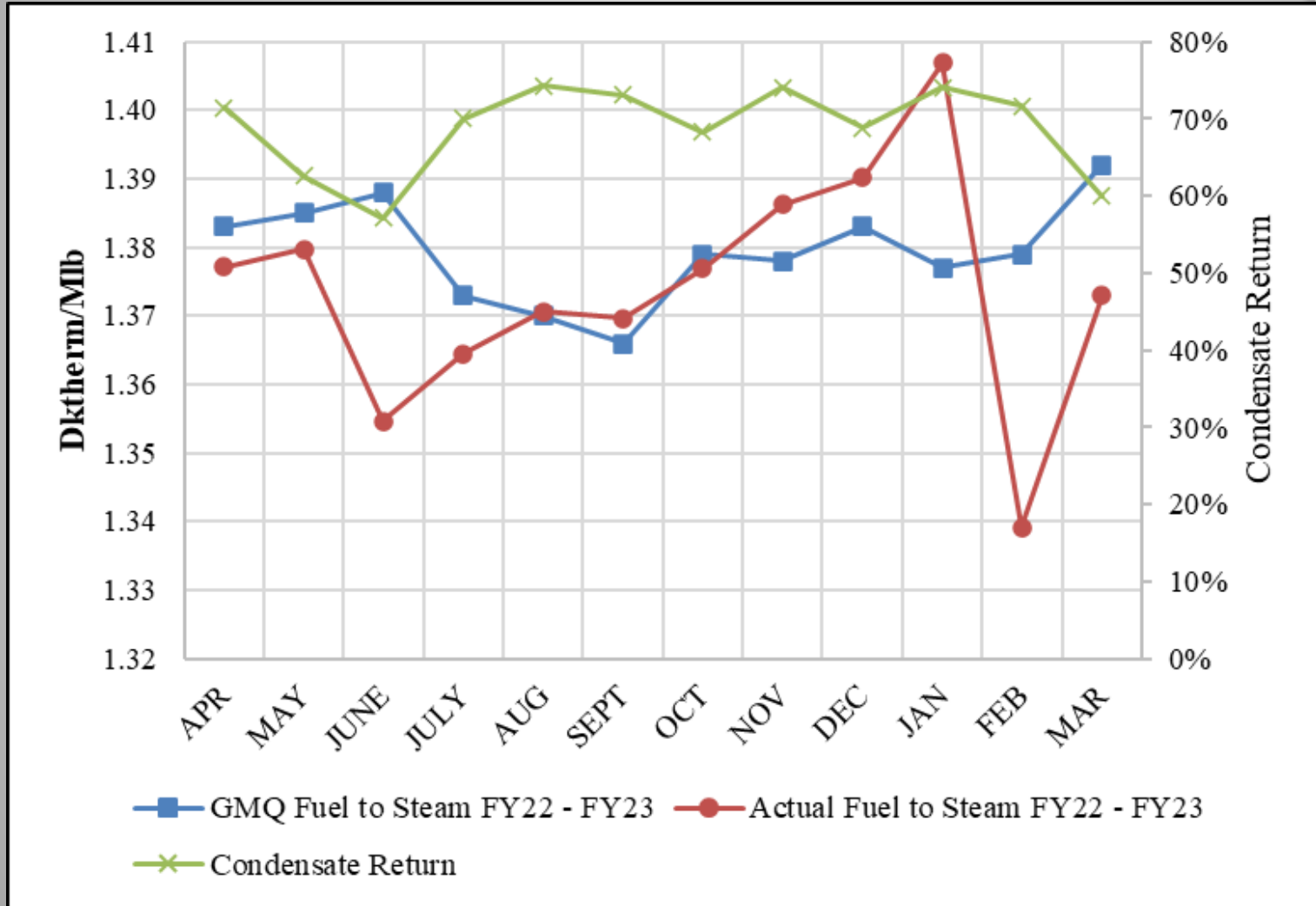
GMQ met in all months shown.

# Performance Measurement FY23: Steam Electric



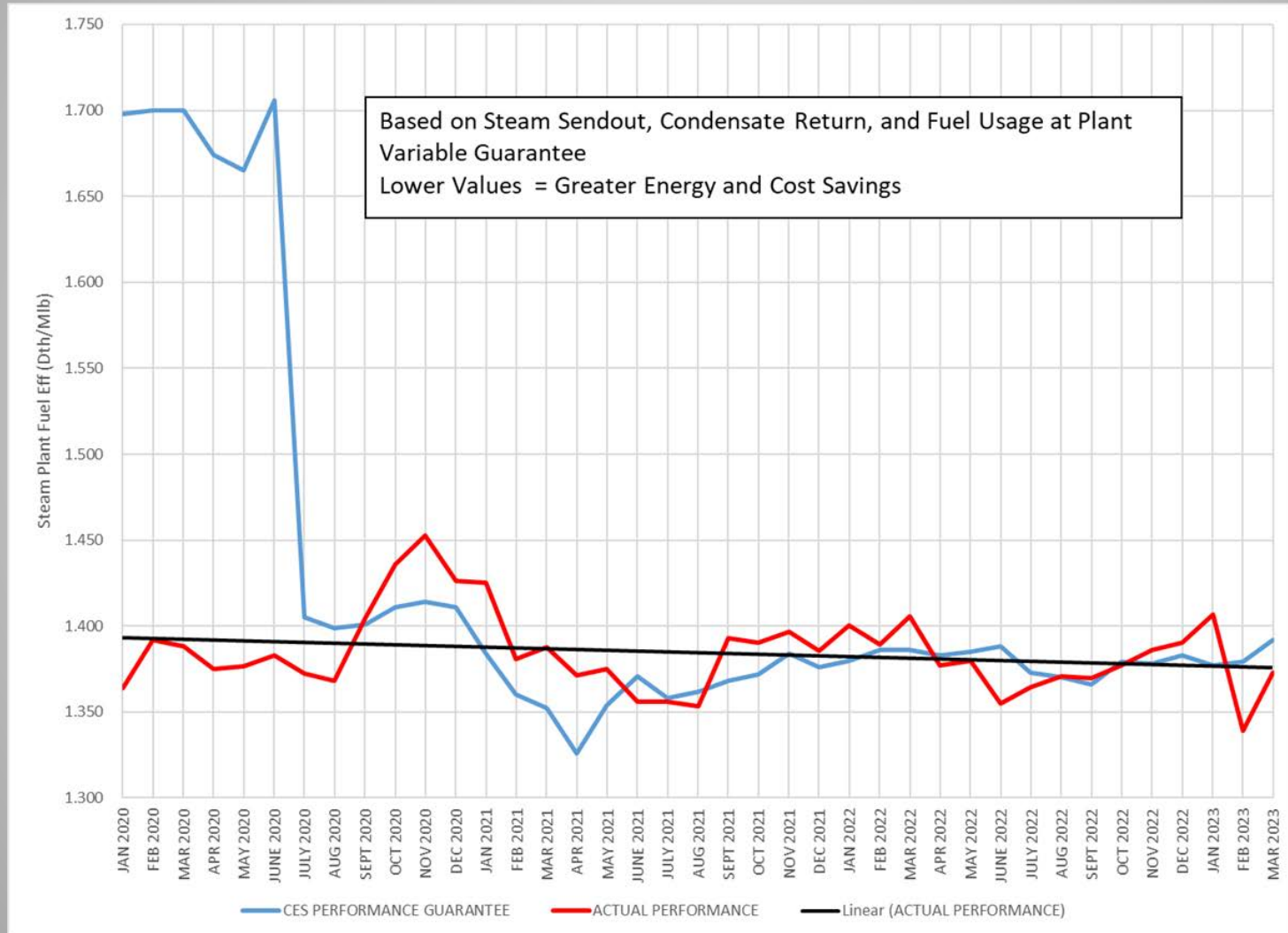
GMQ met in all months shown.

# Performance Measurement FY23: Steam Plant Eff ● -



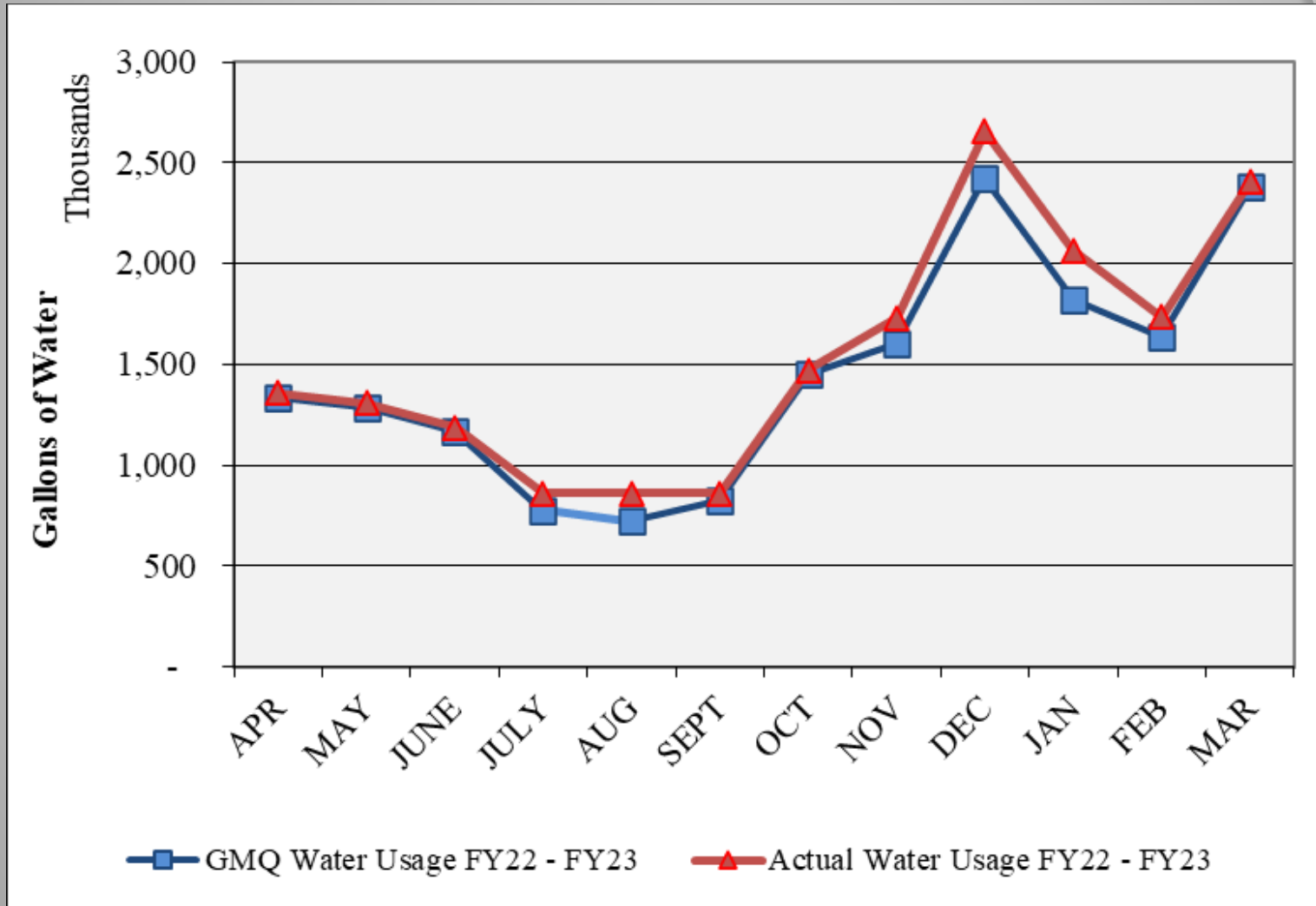
GMQ met in Apr, May, Jun, Jul, Oct, Feb, and Mar.

# Performance Measurement FY23: Steam Plant Eff



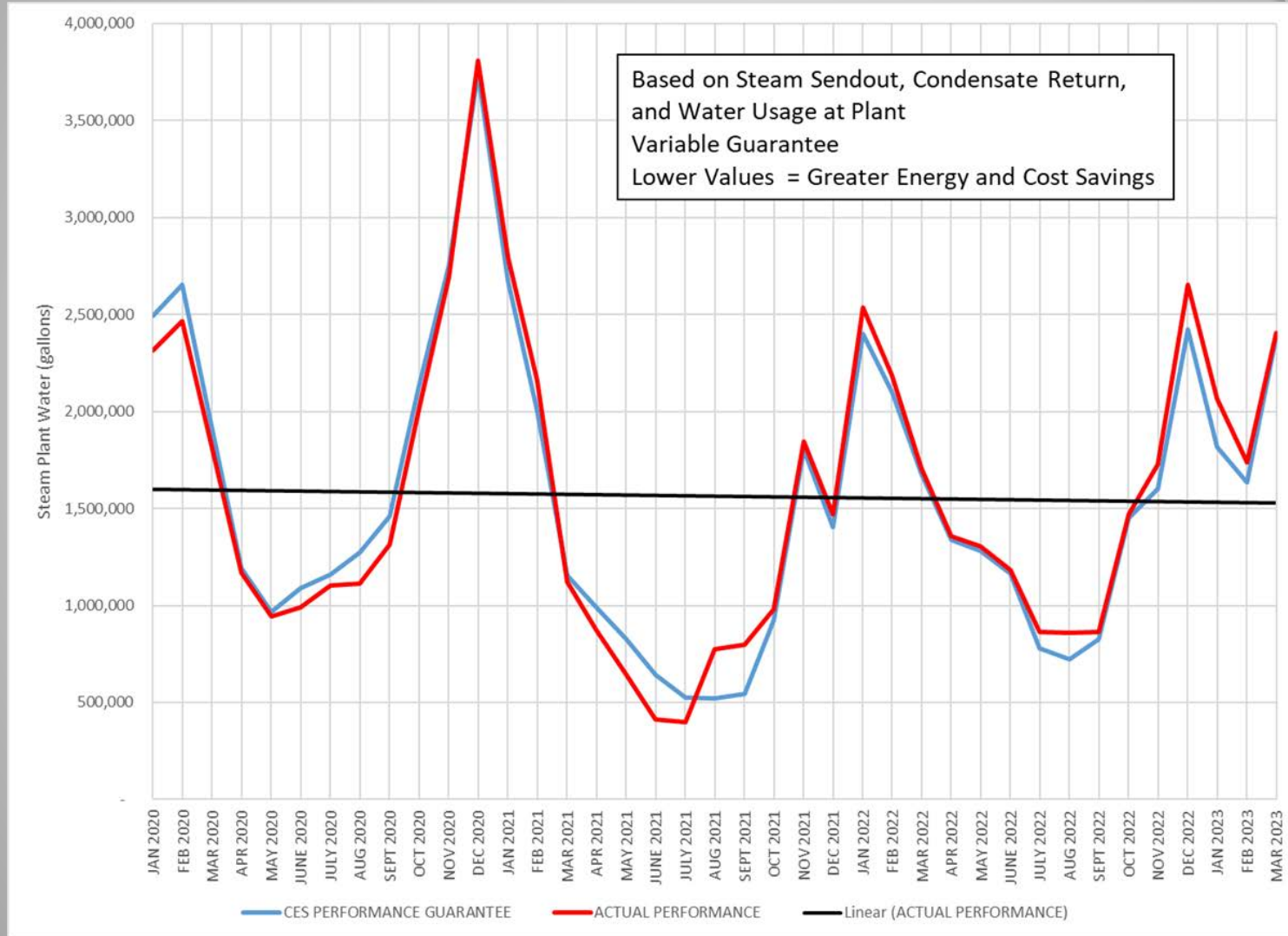
GMQ met in Apr, May, Jun, Jul, Oct, Feb, and Mar.

# Performance Measurement FY23: Steam Water



GMQ exceeded in all months shown. Average difference for the quarter is > 7%.

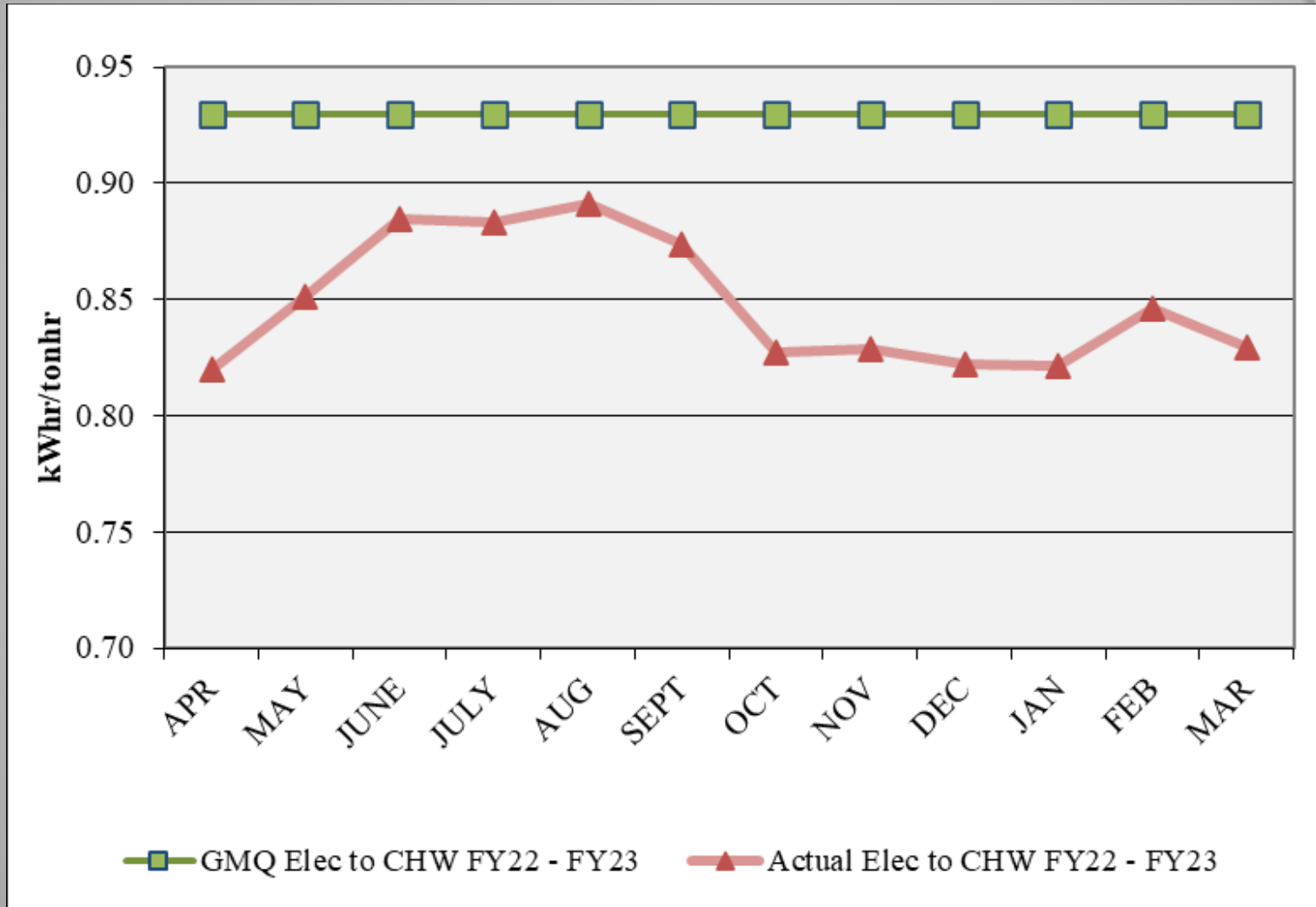
# Performance Measurement FY23: Steam Water



GMQ exceeded in all months shown. Average difference for the quarter is > 7%.



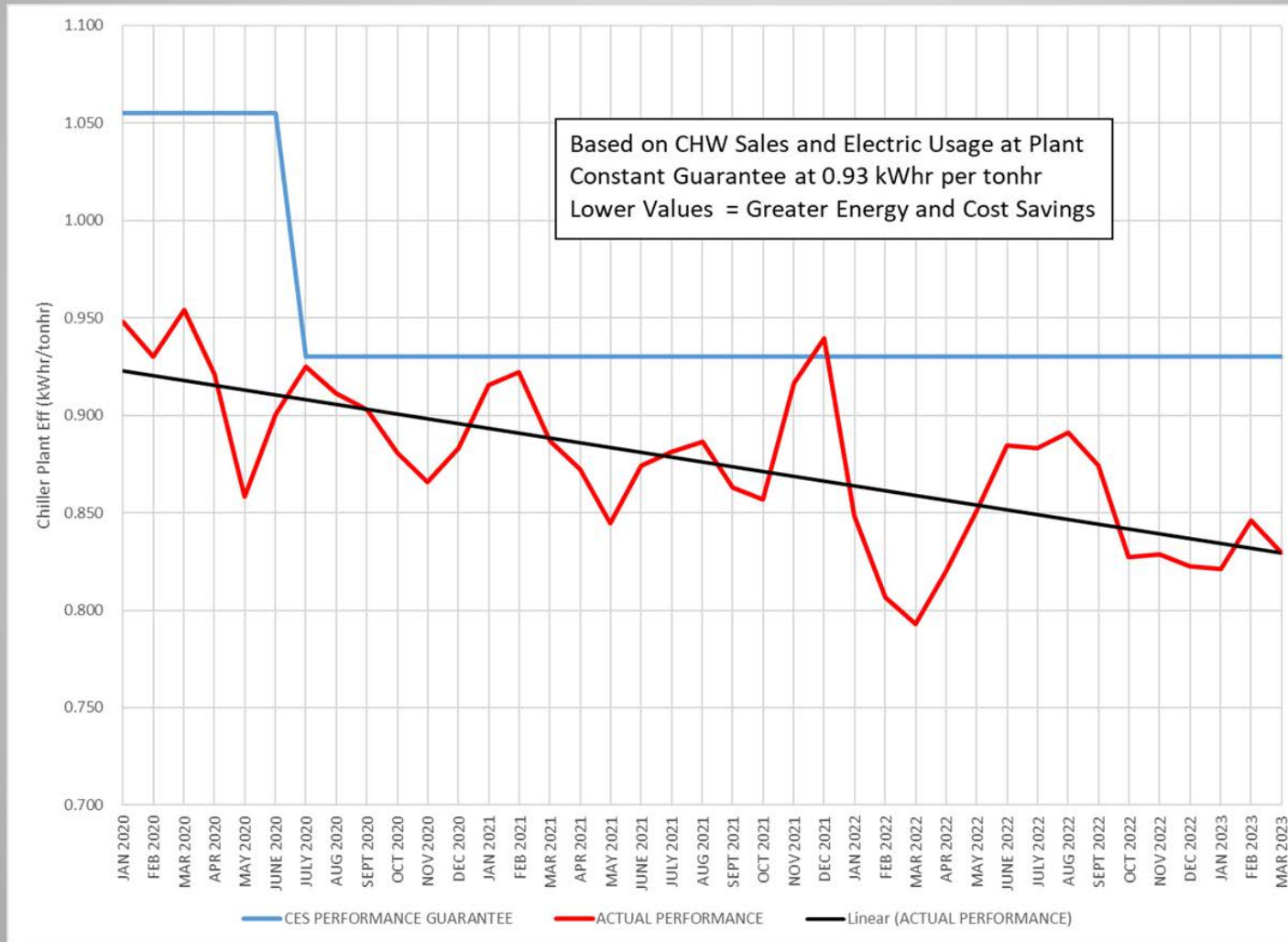
# Performance Measurement FY23: CHW Electric



GMQ met in all months shown.

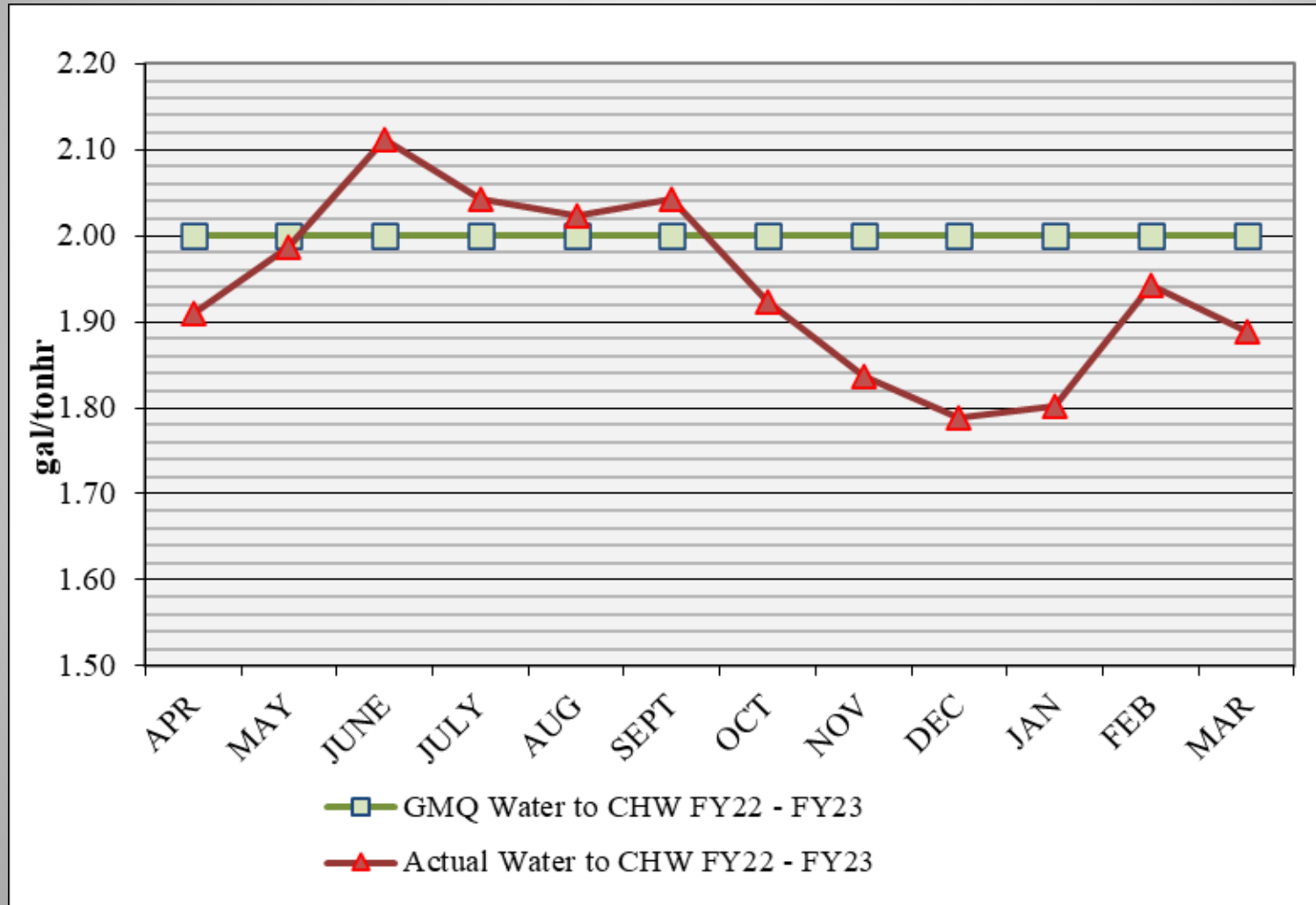


# Performance Measurement FY23: CHW Electric



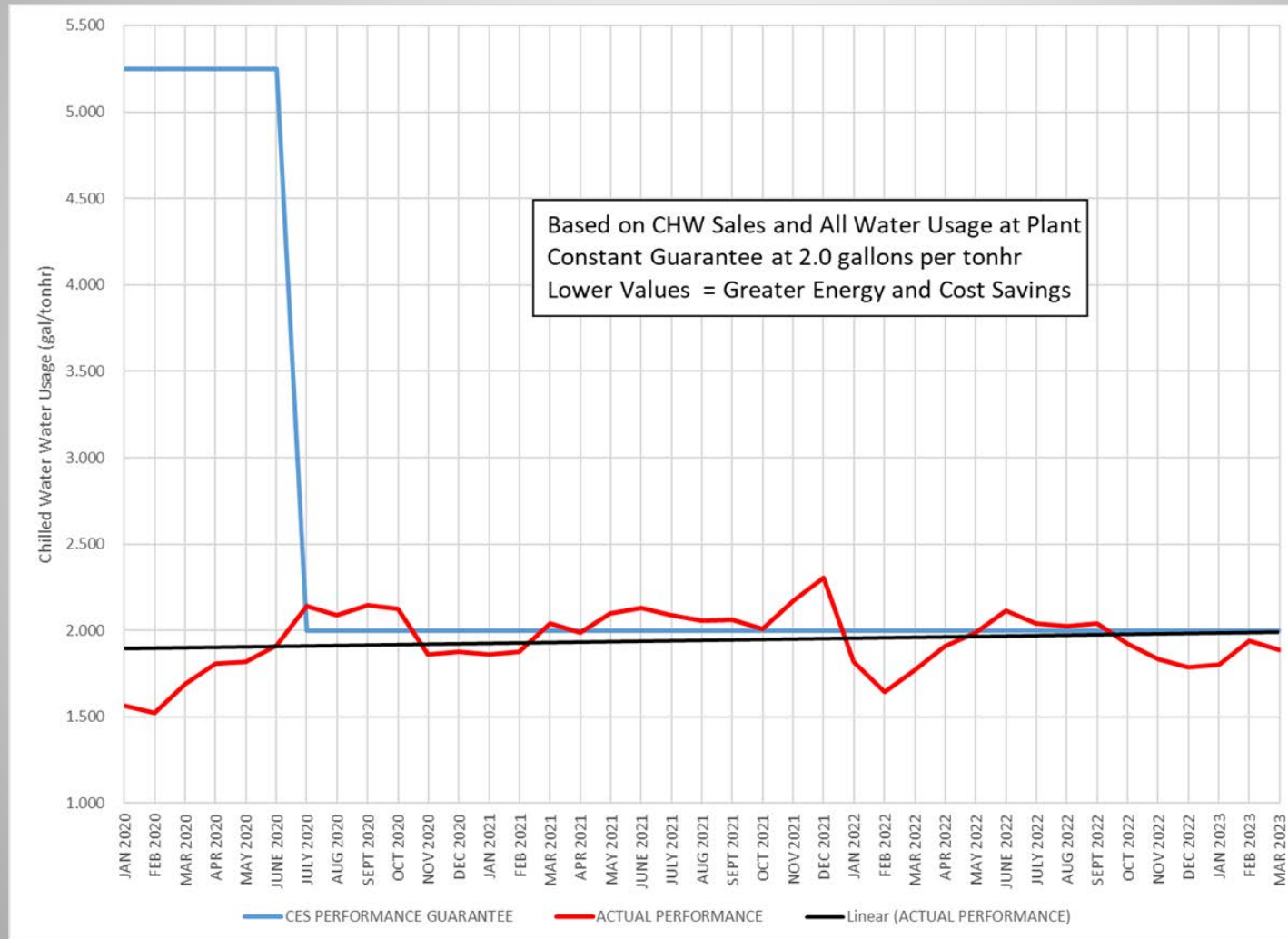
GMQ met in all months shown.

# Performance Measurement FY23: CHW Water



GMQ met Apr, May, Oct, Nov, Dec, Jan, Feb, and Mar.

# Performance Measurement FY23: CHW Water



GMQ met Apr, May, Oct, Nov, Dec, Jan, Feb, and Mar.



# Water Treatment

Q3FY23    Q2FY23    Q1FY23    Q4FY22

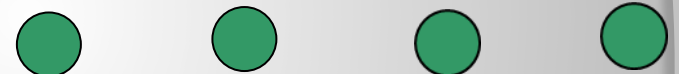
## ❖ Steam and Condensate

- ❖ Corrosion
- ❖ Iron
- ❖ Hardness
- ❖ Chlorine/Sulfite



## ❖ Condensing Water

- ❖ Conductivity
- ❖ Biologicals



## ❖ Chilled Water

- ❖ Hardness
- ❖ Corrosion
- ❖ EGF and Customer Biologicals Good
- ❖ Deposits



❖ Chilled water side-stream filter to be operational Q4FY23



# EGF Walkthrough

Q3FY23    Q2FY23    Q1FY23    Q4FY22

✓ Equipment Maintenance	●	●	●	●
✓ Operations	●	●	●	●
✓ Electrical	●	●	●	●
✓ Housekeeping	●	●	●	●
✓ Building Structure	●	●	●	●
✓ Building Exterior and Grounds	●	●	●	●



# EDS Walkthrough

Q3FY23    Q2FY23    Q1FY23    Q4FY22

✓ Overall Status; Tunnels	● -	● -	● -	● -
✓ Overall Status; Vaults	● -	● -	● -	● -
✓ Housekeeping	●	●	●	● -
✓ Maintenance Items				
✓ Piping	● -	● -	● -	● -
✓ Insulation R/R	● -	● -	● -	● +
✓ Water Infiltration	● +	● +	● +	●
✓ Corrosion of Structural Metal Components	● -	● -	● -	● -
✓ Safety Items	●	●	●	●





## *5. Natural Gas Purchasing*

- ❖ Natural Gas Purchasing Review
  - ❖ Table 5: FY23 Gas Spending & Budget Comparison
  - ❖ Figure 5: Actual and Projected Fuel Cost Comparison

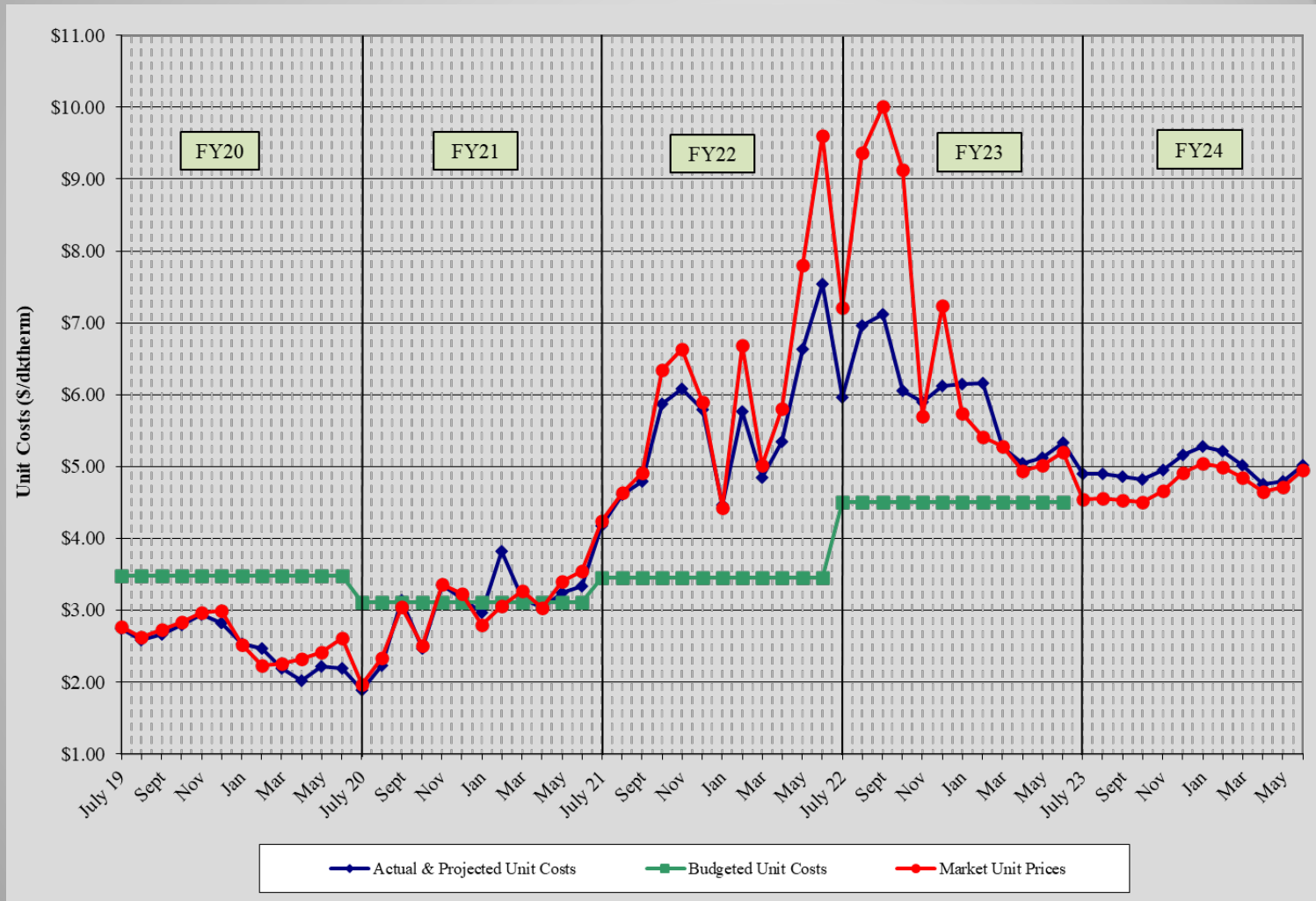


## Table 5: FY23 Gas Spending & Budget Comparison

		Actual FY23 To Mar 31	Budget FY23	Percent Difference
Steam Sendout (Mlbs)		324,437	332,513	-2.4%
Fuel Use (Dth) (includes propane)	●	447,091	480,149	-6.9%
Plant Eff (Dth/Mlb)	●	1.378	1.444	-4.6%
Total Gas Cost (includes propane)	●	\$2,770,543	\$2,165,472	27.9%
Unit Cost of Fuel (\$/Dth)	●	\$6.197	\$4.510	37.4%

Excludes consultant fees, FEA, and pre-purchased and stored propane; Includes transportation and actual propane costs and usages

# Figure 5. Actual and Projected Fuel Cost Comparison



Currently hedging 80% of natural gas through FY23 and 50% through FY24; transportation costs included.

## 6. FY23 Costs to Date

Item	FY23 Budget	FY23 Actual to date	Percent of FY23 Budget
FOC's	\$ 4,006,800	\$ 3,005,114	75.00%
Pass Throughs			
Administrative Costs	\$ 932,100	\$ 430,074	46.14%
Chemicals	\$ 255,700	\$ 157,539	61.61%
R&I Fund Transfers	\$ 303,700	\$ 253,083	83.33%
Water/Sewer	\$ 773,400	\$ 767,130	99.19%
Fuel Base	\$ 2,797,256	\$ 2,797,256	100.00%
Fuel Contingency	\$ 677,044	\$ 24,079	3.56%
Electricity	\$ 6,394,800	\$ 4,342,042	67.90%
ORF Deposit	\$ 85,800	\$ 71,500	83.33%
Debt Service	\$ 4,311,300	\$ 3,359,031	77.91%
<b>Total Expenses</b>	<b>\$ 20,537,900</b>	<b>\$ 15,206,849</b>	<b>74.04%</b>
<b>Total Revenues</b>	<b>\$ 20,163,600</b>	<b>\$ 15,306,849</b>	<b>75.91%</b>
<b>Metro Funding</b>	<b>\$ 374,300</b>	<b>\$ 280,725</b>	<b>75.00%</b>

Actual Costs and Revenues to Date include FY22 True-up Items.

# FY23 Budget

Item	FY22 Budget	FY23 Budget	Percent of FY22 Budget
FOC's	\$ 3,890,100	\$ 4,006,800	3.00%
Pass Throughs			
Administrative Costs	\$ 459,600	\$ 932,100	102.81%
Chemicals	\$ 232,200	\$ 255,700	10.12%
R&I Fund Transfers	\$ 294,800	\$ 303,700	3.02%
Water/Sewer	\$ 751,500	\$ 773,400	2.91%
Fuel Base	\$ 2,115,186	\$ 2,797,256	32.25%
Fuel Contingency	\$ 516,814	\$ 677,044	31.00%
Electricity	\$ 6,329,500	\$ 6,394,800	1.03%
ORF Deposit	\$ -	\$ 85,800	
Debt Service	\$ 5,083,200	\$ 4,311,300	-15.19%
<b>Total Expenses</b>	<b>\$ 19,672,900</b>	<b>\$ 20,537,900</b>	<b>4.40%</b>
<b>Total Revenues</b>	<b>\$ 19,042,200</b>	<b>\$ 20,163,600</b>	<b>5.89%</b>
<b>Metro Funding</b>	<b>\$ 630,700</b>	<b>\$ 374,300</b>	<b>-40.65%</b>

## 7. *Marketing*

- Remaining Capacity for Sale (approximate)
  - 2,429 tons of chilled water
  - 35,105 pph of steam
  
- Potential New Customer Interest
  - ~6,000 tons
  - ~87,000 pph (or equivalent)
  
- Potential Customers
  - Contacts with several A/E regarding new developments

## *Marketing (con't)*

- Peabody St Development
  - 1<sup>st</sup> and KVB
    - Potential ~1,100 tons and ~17,000 MBTUH hot water
    - Early stages of discussions
  - 4<sup>th</sup> and Lea Ave
    - Potential ~500 tons and ~7,500 MBTUH hot water
    - Residential and Retail
    - Interested service
- Peabody and Rutledge
  - Potential ~2,000 tons and ~36,000 MBTUH hot water
  - Residential and Retail
  - Early stages of discussions



## *Marketing (con't)*

- New Development North of KVB
  - Printer's and Banker's Alley
    - ~450 tons Apartment and Retail Development
    - No interest in steam at this point
    - Building design progressing with DES
  - 7<sup>th</sup> and Commerce
    - Interested in 660 tons and 14,500 pph steam
    - Hotel, Restaurants and Retail
    - Anticipate being a customer
  - 8<sup>th</sup> and Demonbreun
    - Early stages of discussions



## 8. *Capital Expenditure Update*

	<b>Spent to End of FY22</b>	<b>FY23 Spending</b>	<b>Balance to Date (04/26/23)</b>
R&I Projects	\$4,358,854	\$75,005	\$438,572
49116-DES Infrastructure Fund	\$4,649,663	\$223,664	\$4,500,530
<b>Total</b>	<b>\$9,008,517</b>	<b>\$298,669</b>	<b>\$4,939,102</b>

## *Capital Projects Review*

### **Active Capital Projects – General & Marketing**

- DES 139: Options Review - closed
- DES 163: Peabody Union – working with developer on Guthrie St impact to DES; blasting is complete
- DES 192: Peabody St Developments – survey of routing down Peabody; DES plan for expansion in area with new customers
- DES 195: DES Parking Area – review of options for developing a parking area on the west side of the EGF to replace space lost in the Guthrie St development; preliminary drawings presented to TEG/Metro
- DES 200: Side-stream Filter – addition of filter on CHW at EGF; installation expected 3<sup>rd</sup> Qtr FY23 with operation in 4<sup>th</sup> Qtr

## *Capital Projects Review*

### **Active Capital Projects – General & Marketing**

- DES 201: East Bank Development – ongoing development and marketing activities related to the proposed Titans stadium, Oracle, and other potential developments on the East Bank
- DES 202: 7<sup>th</sup> and Commerce Hotel – proposed hotel intends to be a customer; service will extend from 7<sup>th</sup> Ave
- DES 203: Printer’s and Banker’s Alley Building – proposed residential and retail site intends to be a customer; service will extend from Union St.
- DES 204: New Signs for EGF – closed

## *Capital Projects Review*

### **Active Capital Projects – Corrosion Repair/Prevention**

- DES 143: MH N1 and N2 Insulation – MH N1 corrosion cleaned and coated; CES to install insulation in MH N2 under Amendment 2 obligations; MH N1 insulation moved to DES207 therefore this project will be closed.
- DES 178: MH 5 Repairs – corrosion/concrete/insulation repairs; piping insulation remains to be completed. Insulation expected to be completed during the 4<sup>th</sup> Qtr FY23.
- DES 180: State Tunnel Support Repairs – several of the supports in the State Tunnel are corroded and need to be cleaned and coated to prevent further propagation of the corrosion. The project was temporally delayed but is expected to be completed in the 4<sup>th</sup> Qtr FY23.

## *Capital Projects Review*

### **Active Capital Projects – Corrosion Repair/Prevention**

- DES 193: MH 13 Pipe and Pipe Support Repairs – closed
- DES 194: MH B4 Repairs – cleaning and coating of structural steel; re-insulation of piping; pre-bid meeting was held during 2<sup>nd</sup> Qtr FY23; construction began late 3<sup>rd</sup> Qtr FY23; work is expected to be completed during 4<sup>th</sup> Qtr FY23.

## *Capital Projects Review*

### **Active Capital Projects – Repairs/Modifications**

- DES 191: MH 20 Repairs – condensate return piping leaking (corrosion); ground/surface water collection/diversion needed; new access ladder needed; bid in late 3<sup>rd</sup> Qtr FY22; contractor delays; supply chain delays; underground work is complete. Anticipate construction completion by end of 4<sup>th</sup> Qtr FY23.
- DES 196: Exploratory Excav. & Cond. Leak Repair at MH 9 – TEG design is 95% complete; will also include pipe replacement at MH 10 and MH 11; anticipate bidding during 4<sup>th</sup> Qtr FY23
- DES 198: MH18 Condensate Pump Replacement – replace pumps with new configuration to improve reliability and automation; pumps and VFDs delivered; anticipate bid/construction 4<sup>th</sup> Qtr FY23
- DES 199: MH D3 Sparge Tube Addition – closed



## *Capital Projects Review*

### **Active Capital Projects – Repairs/Modifications**

- DES 205: January CHW Outage – work is complete; milling and paving is scheduled to be completed during April; TEG will need to review cost substantiation; anticipate closing project during 4<sup>th</sup> Qtr FY23.
- DES 206: 7<sup>th</sup> Ave Tunnel Fan Replacement – 7<sup>th</sup> Ave Tunnel ventilation fan disintegrated while in operation; no injuries; new fan has been ordered; work scope to be bid; expect work to take place during 1<sup>st</sup> Qtr FY24
- DES 207: MH N1 Insulation – CES was going to install insulation under their Amendment 2 obligations however, the result would have met CES's obligation past their contract expiration. Therefore, a new project number was assigned, and this work will be paid for by Metro.



## 9. *Side Stream Filter*

- Installed on chilled water return at EGF
- Filters chilled water at 500 gpm filtering all the water in about two months
- Will remove suspended solids down to 0.5 micron
- Improves water quality delivered to customers which may also improve heat transfer at customer bldgs
- Anticipated to become operational in May 2023

## *Side Stream Filter (under construction)*



***Constellation Energy Solutions,  
LLC  
System Operator***



## *10. Other Board Member Items*

*RFQ for DES PA is completed. TEG received the executed agreement May 4, 2023. TEG is continuing with its oversight responsibilities and proceeding with the preliminary design of the new service to the new customer, 7<sup>th</sup> and Commerce hotel.*



# 11. Adjourn

*Customer Meeting – May 25, 2023, at 11:30 a.m.  
Nashville Downtown Partnership 4<sup>th</sup> and Commerce  
RSVP*

*August Meeting at MWS Biosolids Building Conference Room  
(1810 Cement Plant Rd) In-Person Only*

- *Advisory Board Meeting Schedule*
- *FY23 – 4<sup>th</sup> Quarter Meeting – August 17, 2023*
- *FY24 – 1<sup>st</sup> Quarter Meeting – November 16, 2023*
- *FY24 – 2<sup>nd</sup> Quarter Meeting – February 15, 2024*
- *FY24 – 3<sup>rd</sup> Quarter Meeting – May 16, 2024*