



Metro Nashville
DISTRICT ENERGY SYSTEM

DES Advisory Board Meeting

First Quarter FY24

November 16, 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. FY24 Costs to Date and Budget
7. Marketing
8. Capital Projects Review & Status
9. Other Board Member Items
10. Adjourn

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

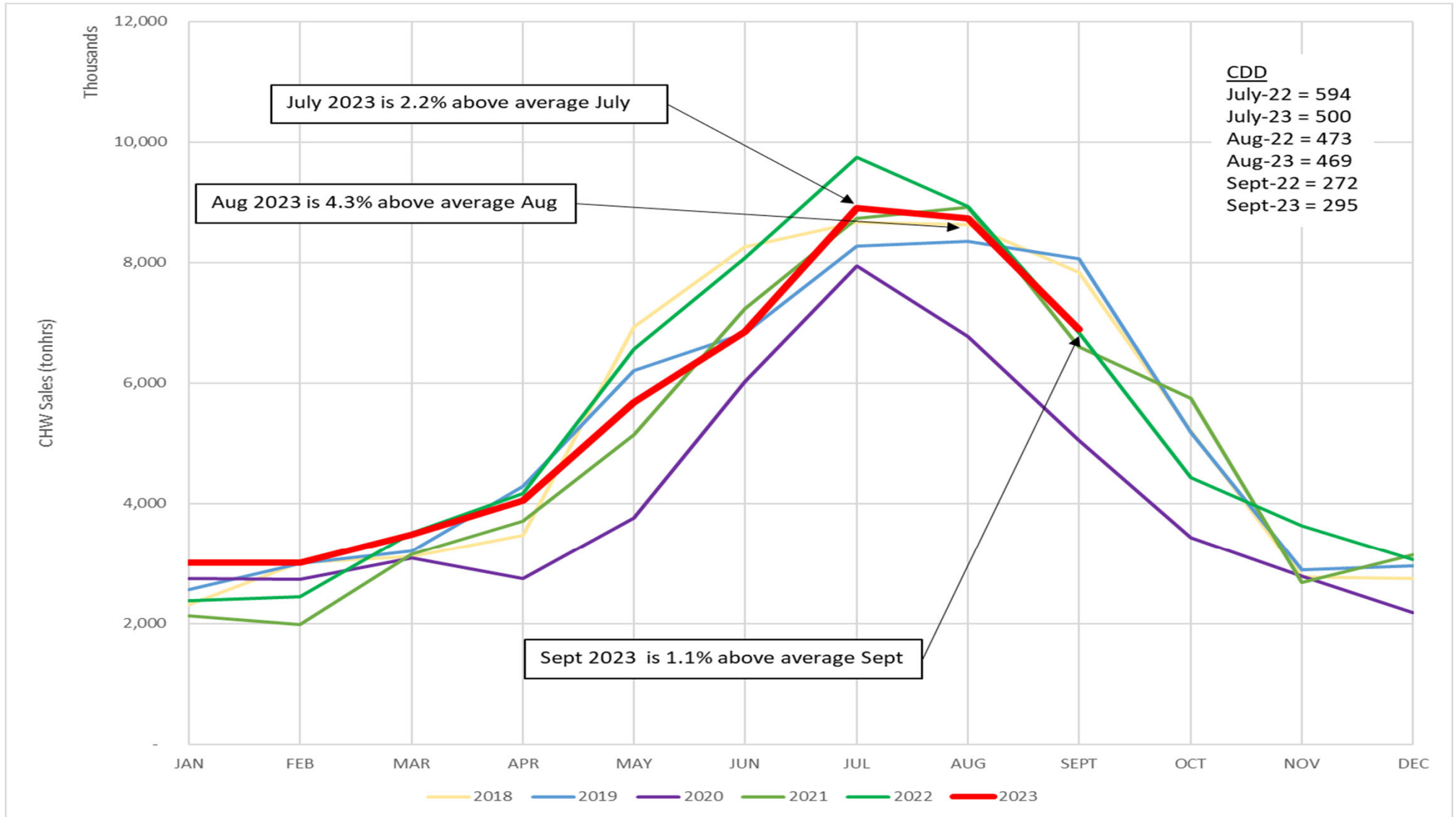
3. *Customer Sales*

- ❖ There are 0 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

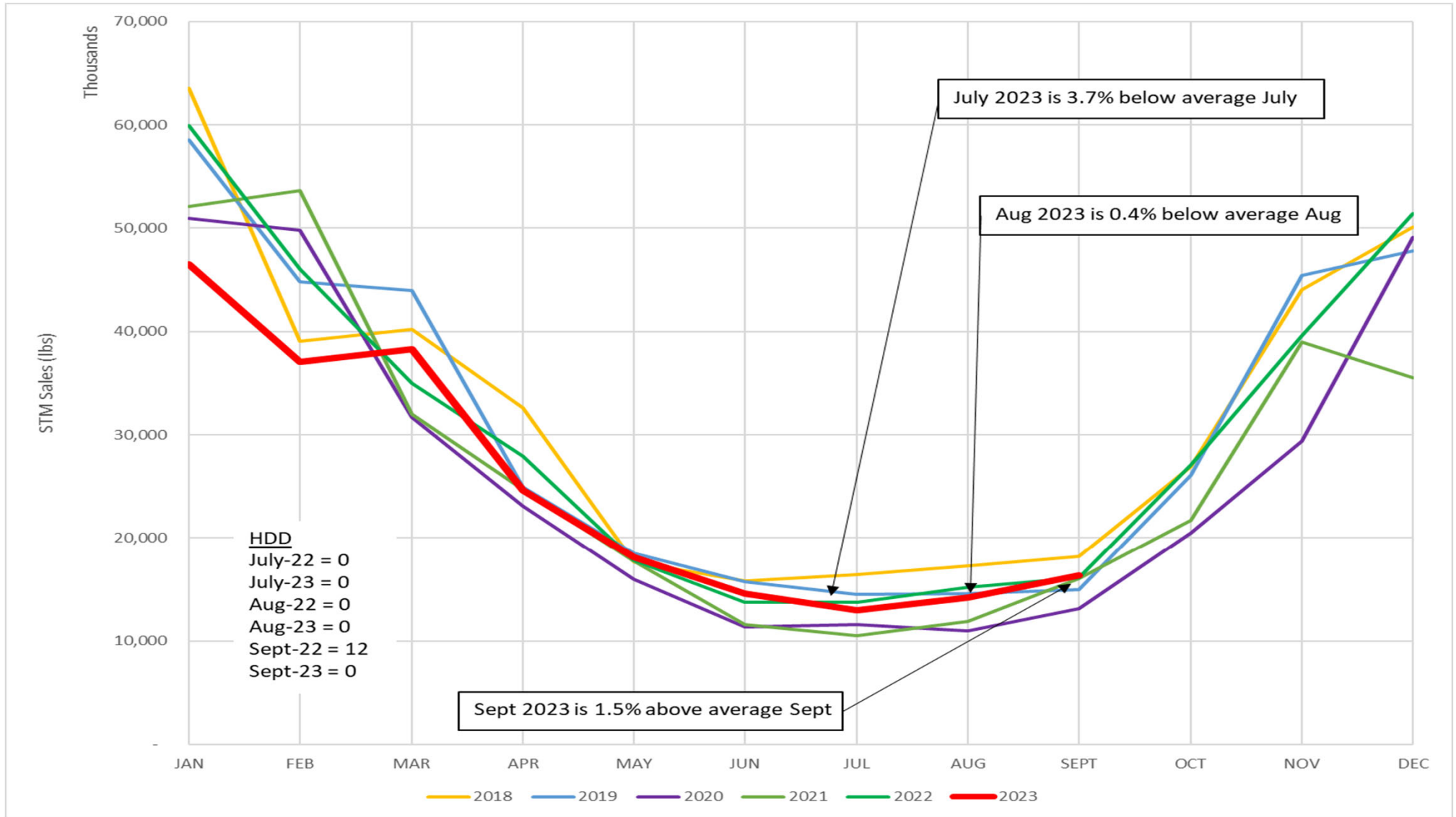
		Steam - Rolling 12 Month			Chilled Water - Rolling 12 Month		
		Oct 2021- Sept 2022	Oct 2022- Sept 2023	% Diff.	Oct 2021- Sept 2022	Oct 2022- Sept 2023	% Diff.
Private	Cost	\$ 1,733,552	\$ 1,743,964	0.60%	\$ 4,497,864	\$ 4,514,174	0.36%
	Usage (lbs or tonhrs)	93,832,584	94,819,609	1.05%	23,382,999	21,969,689	-6.04%
State	Cost	\$ 2,182,984	\$ 2,223,241	1.84%	\$ 3,465,403	\$ 3,523,450	1.68%
	Usage (lbs or tonhrs)	108,845,815	112,850,918	3.68%	14,053,007	13,796,320	-1.83%
Metro	Cost	\$ 2,235,496	\$ 2,152,512	-3.71%	\$ 5,047,744	\$ 5,048,873	0.02%
	Usage (lbs or tonhrs)	138,946,799	133,081,269	-4.22%	26,815,947	26,005,960	-3.02%
Aggregate	Cost	\$ 6,152,032	\$ 6,119,717	-0.53%	\$ 13,011,011	\$ 13,086,497	0.58%
	Usage (lbs or tonhrs)	341,625,198	340,751,796	-0.26%	64,251,953	61,771,969	-3.86%
	Unit Cost	\$ 18.01	\$ 17.96	-0.3%	\$ 0.202	\$ 0.212	4.62%

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.

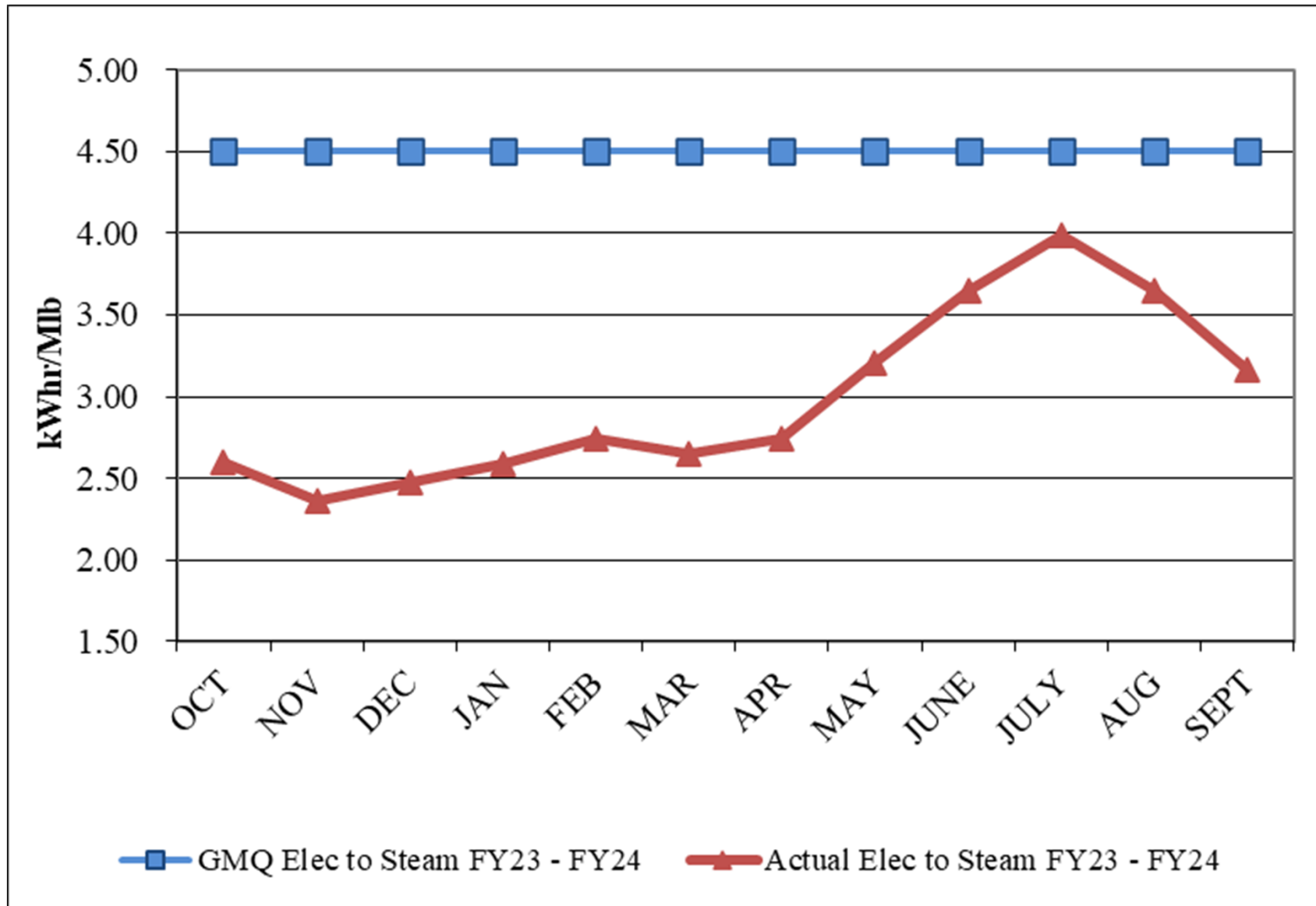
4. *Review of DES Contractor Performance*

CES has made improvements in FY24 and has met several of the performance metrics for Q1. CES continues to address the system energy usage.

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

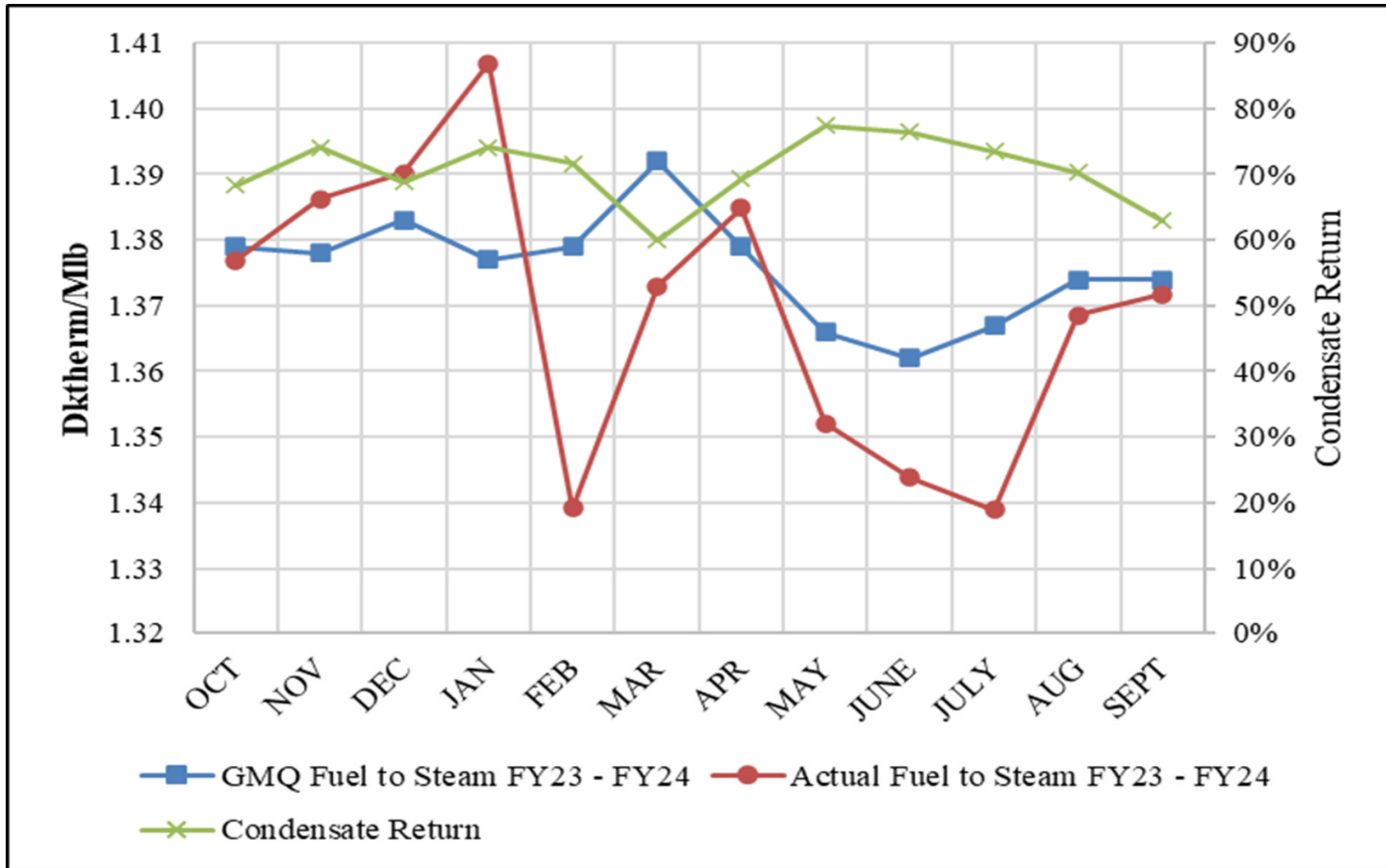
-  Excellent Performance – No Improvement Necessary
-  Satisfactory Performance – Some Improvement Could Be Made
-  Poor Performance – Much Improvement Necessary

Performance Measurement FY24: Steam Electric



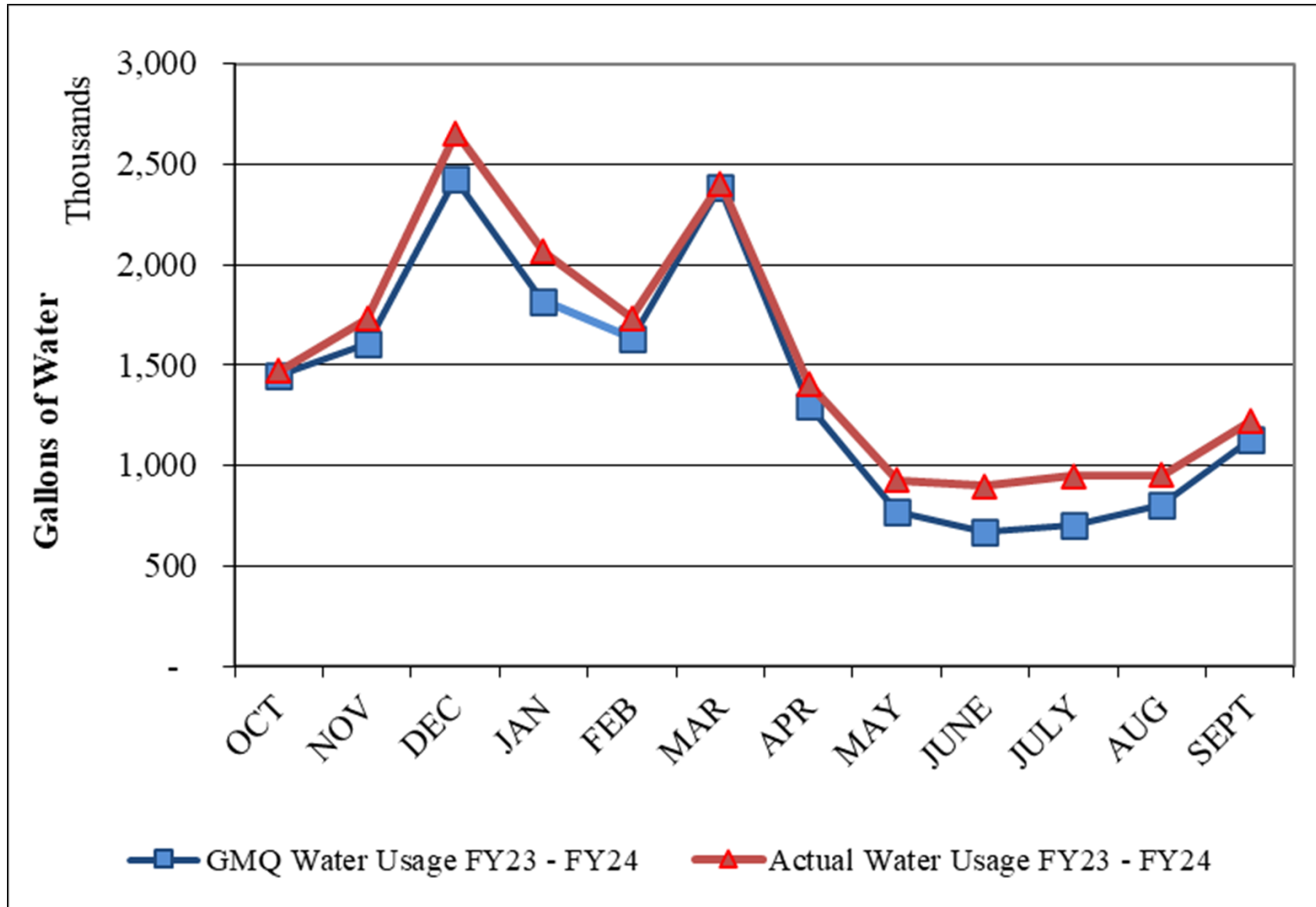
GMQ met in all months shown.

Performance Measurement FY23: Steam Plant Eff ●



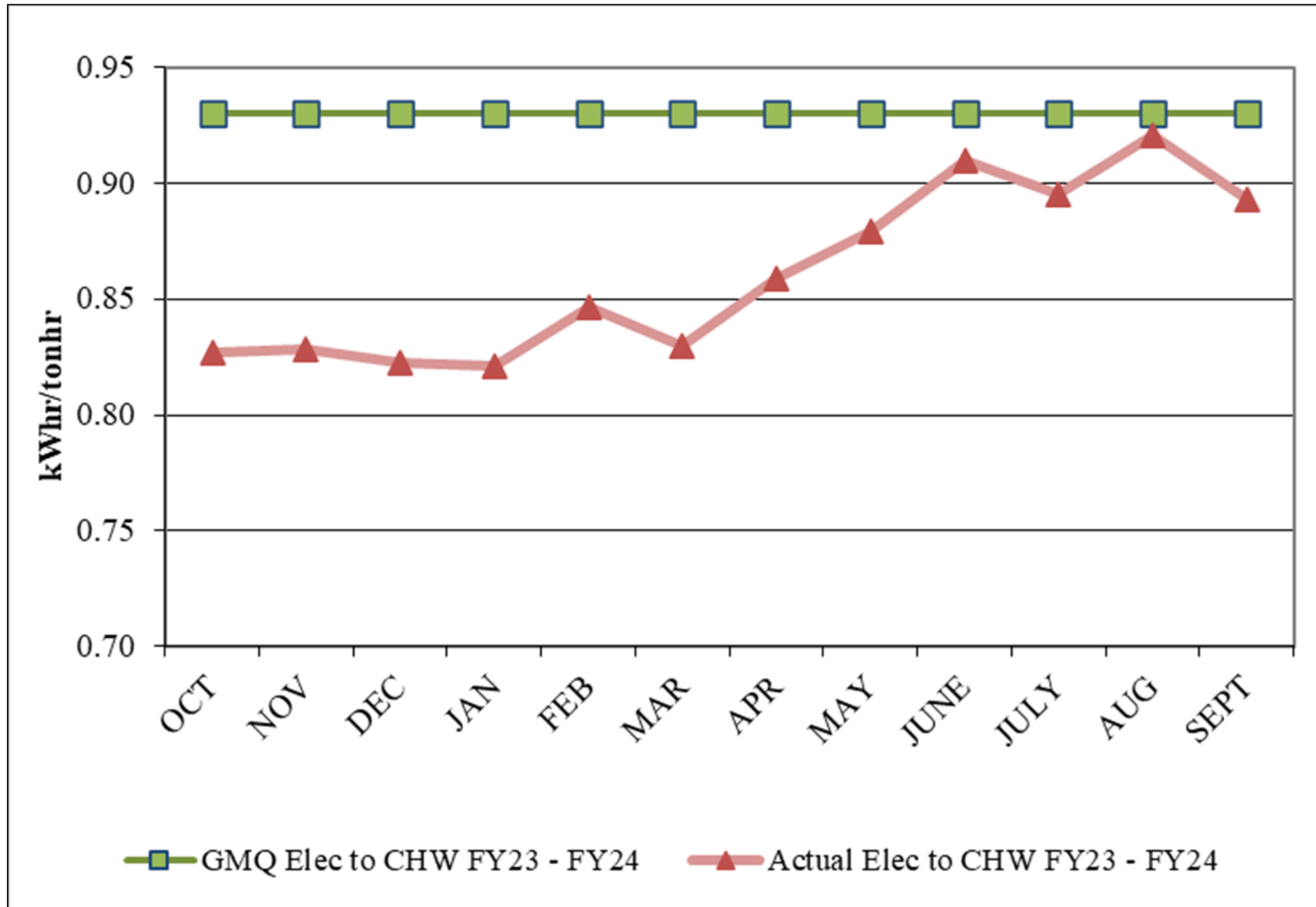
GMQ met Oct, Feb, Mar, May, June, July, Aug, and Sept

Performance Measurement FY23: Steam Water



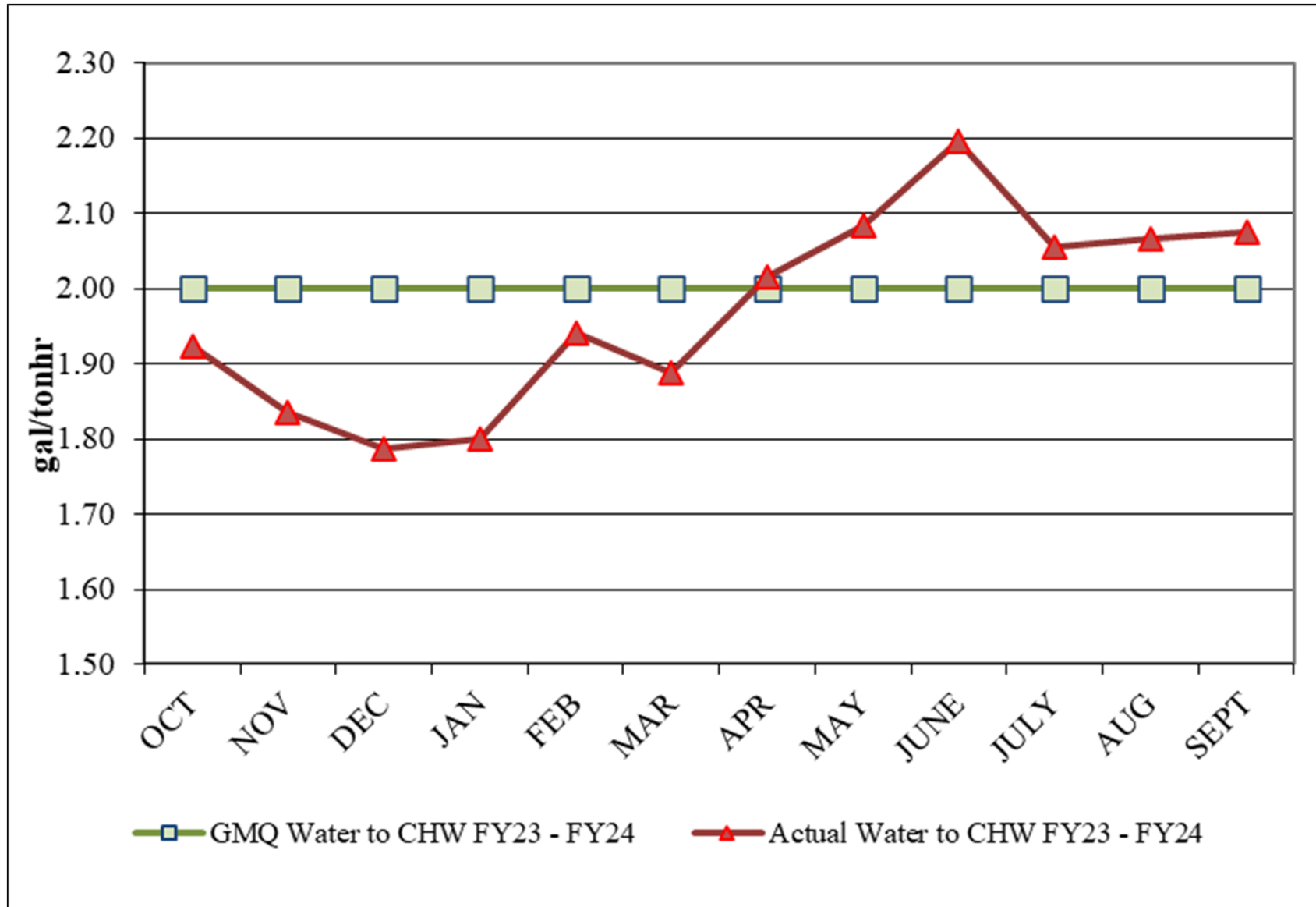
GMQ exceeded in all months shown. Average difference for the quarter is > 15%.

Performance Measurement FY23: CHW Electric



GMQ met in all months shown.

Performance Measurement FY23: CHW Water ●



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

FY23 FEA True-up

	CES Charged Metro and Customers Paid	FY23 Annual True-up	Annual Adjustment for Metro and Customers
Steam Electric	\$ 15,056.19	\$ 14,141.33	\$ (914.86)
Steam Fuel	\$ (10,581.71)	\$ 1,208.59	\$ 11,790.30
Steam Water	\$ (6,047.22)	\$ (6,028.02)	\$ 19.20
Subtotal	\$ (1,572.74)	\$ 9,321.90	\$ 10,894.64
Chilled Water Electric	\$ 100,468.42	\$ 75,819.83	\$ (24,648.59)
Chilled Water Water	\$ (8,520.96)	\$ (180.90)	\$ 8,340.06
Subtotal	\$ 91,947.46	\$ 75,638.93	\$ (16,308.53)
Total	\$ 90,374.72	\$ 84,960.83	\$ (5,413.89)

Water Treatment

Q1FY24 Q4FY23 Q3FY23 Q2FY23

❖ Steam and Condensate



❖ Corrosion

❖ Iron

❖ Hardness

❖ Chlorine/Sulfite

❖ Condensing Water



❖ Conductivity

❖ Biologicals

❖ Chilled Water



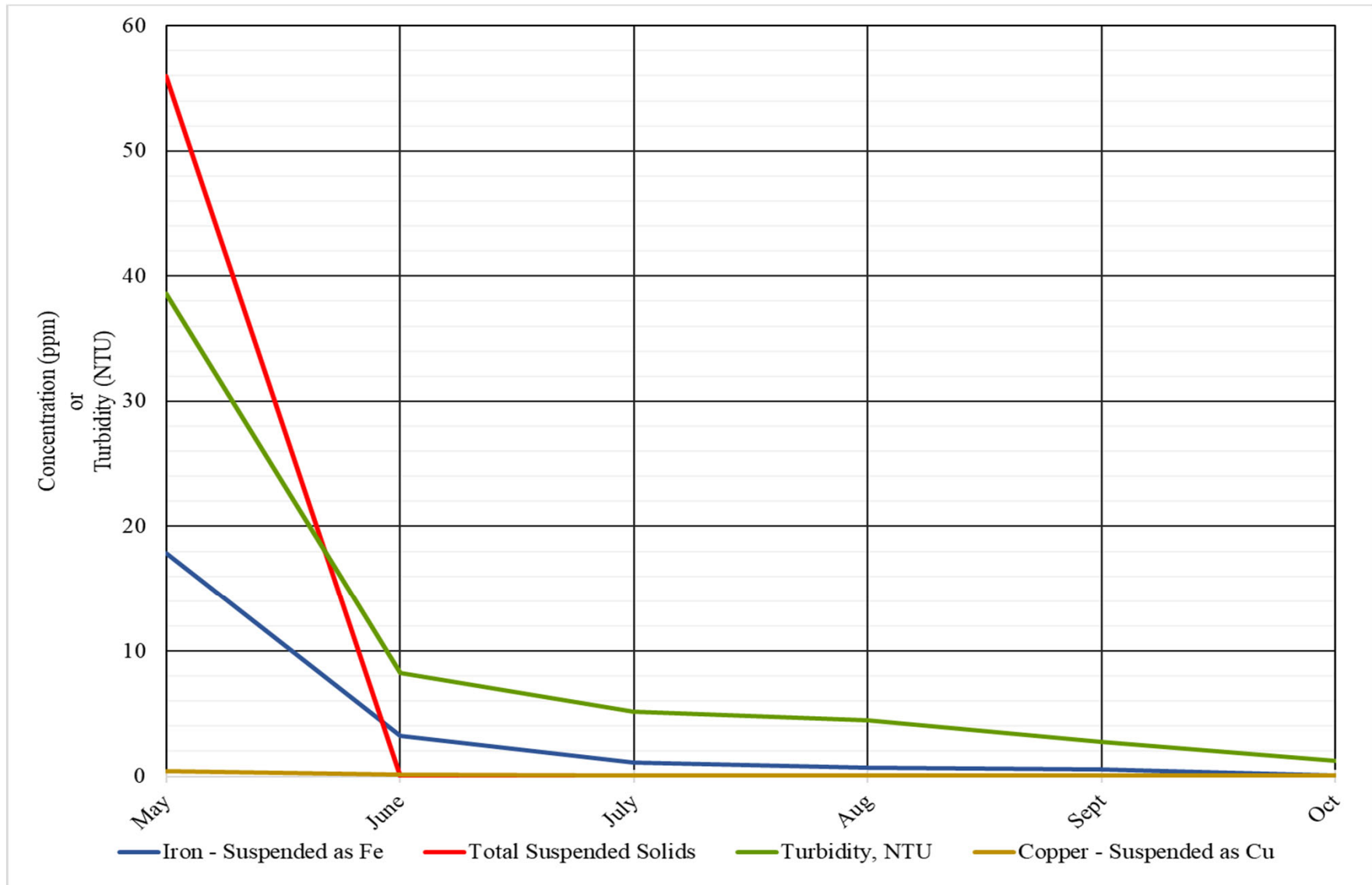
❖ Hardness

❖ Corrosion

❖ EGF and Customer Biologicals Good

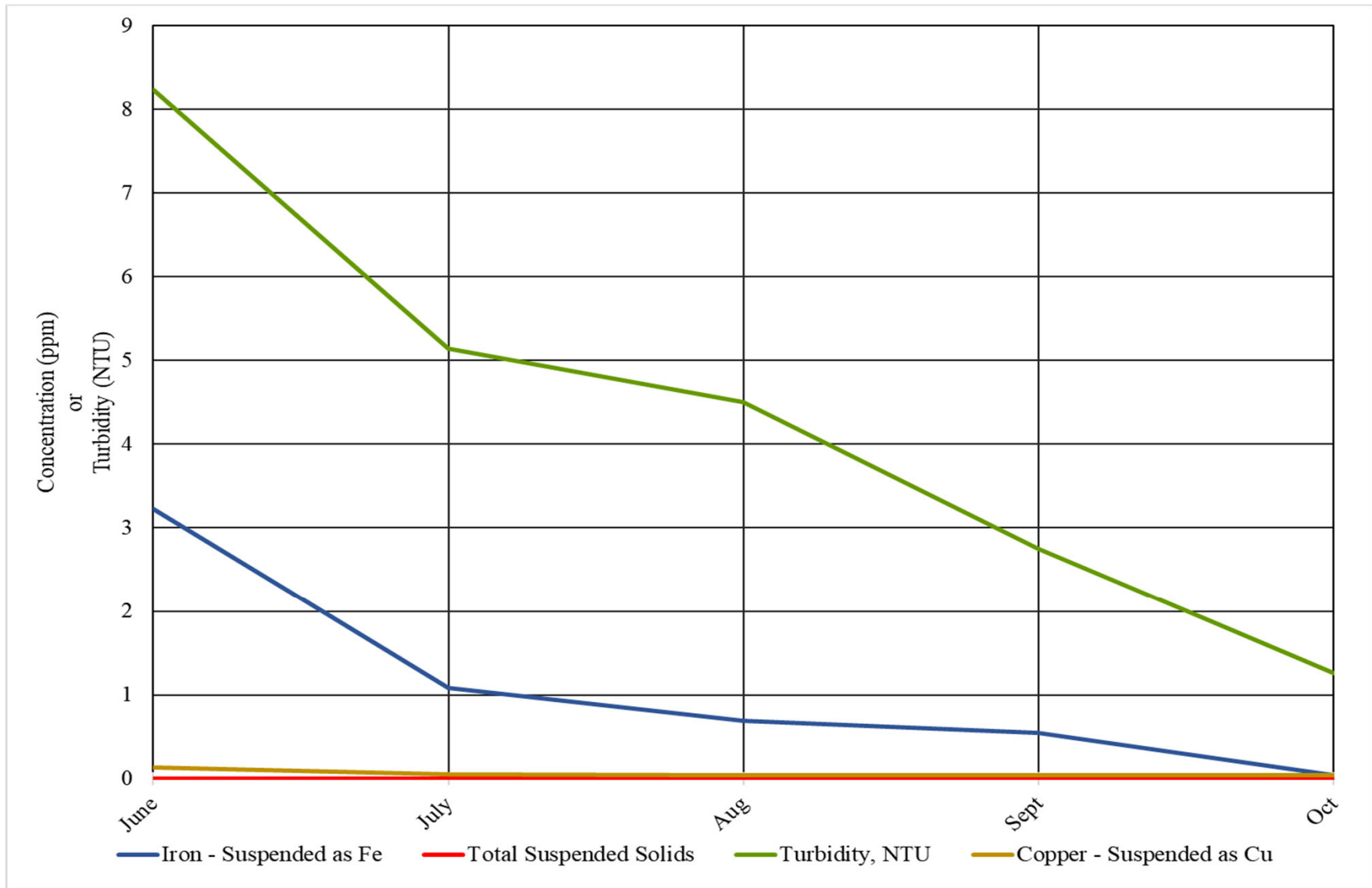
❖ Deposits

Side Stream Filter Performance



Decrease in backwash noted over the quarter. May data is pre-start-up; operational since May 9, 2023.

Side Stream Filter Performance



Copper and Iron are less than 0.04 ppm in October; Total solids below detectable limit since June.

EGF Walkthrough

Q1FY24 Q4FY23 Q3FY23 Q2FY23

	Q1FY24	Q4FY23	Q3FY23	Q2FY23
✓ Equipment Maintenance	●	●	●	●
✓ Operations	●	●	●	●
✓ Electrical	●	●	●	●
✓ Housekeeping	●	●	●	●
✓ Building Structure	●	●	●	●
✓ Building Exterior and Grounds	●	●	●	●



EDS Walkthrough

Q1FY24 Q4FY23 Q3FY23 Q2FY23

✓ Overall Status; Tunnels	●	●	● -	● -
✓ Overall Status; Vaults	● -	● -	● -	● -
✓ Housekeeping	●	●	●	●
✓ Maintenance Items				
✓ Piping	● -	● -	● -	● -
✓ Insulation R/R	● -	● -	● -	● -
✓ Water Infiltration	● +	● +	● +	● +
✓ Corrosion	● -	● -	● -	● -
✓ Lower Priority/Deferred	● -			
✓ Safety Items	●	●	●	●

5. Natural Gas Purchasing

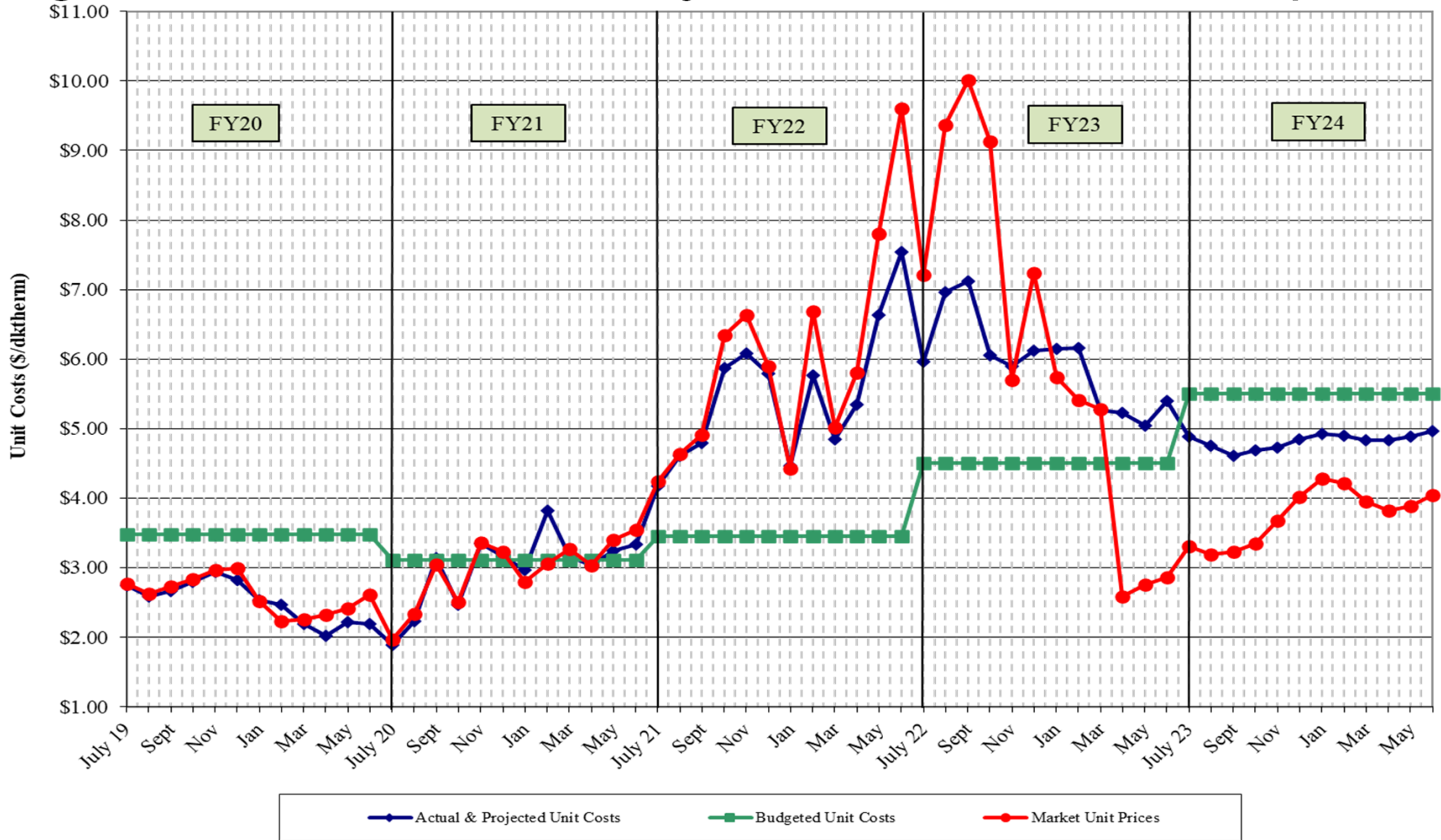
- ❖ Natural Gas Purchasing Review
 - ❖ Table 5: FY24 Gas Spending & Budget Comparison
 - ❖ Figure 5: Actual and Projected Fuel Cost Comparison

Table 5: FY24 Gas Spending & Budget Comparison

	Actual FY24 To Sept 30	Budget FY24	Percent Difference
Steam Sendout (Mlbs)	59,785	63,394	-5.7%
Fuel Use (Dth) (includes propane) ●	81,329	90,844	-10.4%
Plant Eff (Dth/Mlb) ●	1.360	1.433	-5.1%
Total Gas Cost (includes propane) ●	\$385,518	\$500,553	-23.0%
Unit Cost of Fuel (\$/Dth) ●	\$4.740	\$5.510	-14.5%

Excludes consultant fees, FEA, and pre-purchased and stored propane; Includes transportation and actual propane costs and usages. Budget values include price and weather contingencies.

Figure 5. Actual and Projected Fuel Cost Comparison



Currently hedging 70% of natural gas through FY24 and 10% through FY25; transportation costs included.

6. FY24 Costs to Date

Item	FY23 Budget	FY24 Budget	FY24 Actual to date	Percent of FY24 Budget
FOC's	\$ 4,006,800	\$ 4,127,000	\$ 1,031,756	25.00%
Pass Throughs				
Administrative Costs	\$ 932,100	\$ 638,300	\$ 166,427	26.07%
Chemicals	\$ 255,700	\$ 331,200	\$ 67,460	20.37%
R&I Fund Transfers	\$ 303,700	\$ 312,900	\$ 78,225	25.00%
Water/Sewer	\$ 773,400	\$ 1,152,000	\$ 487,211	42.29%
Fuel Base	\$ 2,797,256	\$ 3,422,700	\$ 487,645	14.25%
Fuel Contingency	\$ 677,044	\$ 764,200	\$ -	0.00%
Electricity	\$ 6,394,800	\$ 6,476,700	\$ 2,009,825	31.03%
ORF Deposit	\$ 85,800	\$ 188,200	\$ 47,050	25.00%
Debt Service	\$ 4,311,300	\$ 4,774,000	\$ 1,720,046	36.03%
Total Expenses	\$ 20,537,900	\$ 22,187,200	\$ 6,095,645	27.47%
Total Revenues	\$ 20,163,600	\$ 21,802,800	\$ 5,599,492	25.68%
Metro Funding	\$ 374,300	\$ 384,400	\$ 96,100	25.67%

Actual Costs and Revenues to Date include FY23 True-up Items (\$24,053.55 net charge).

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)
- East Bank Development – Master Developer
 - DES met with The Fallon Company to discuss district energy opportunities on the East Bank with particular attention to their developments
 - The following information was provided by DES to show the favorability of district energy for potential developments:

Marketing (con't)

Met with The Fallon Company

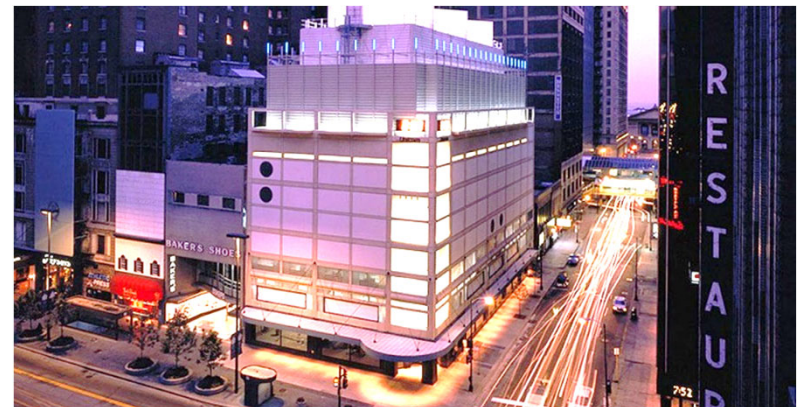
- Introductory discussion: Achieving Key East Bank Plan Considerations Utilizing District Energy
- Opportunities, benefits and approach for incorporating DES into East Bank Waterfront Initial Development Area



Marketing (con't)

Advanced Technology: addressing energy efficiency standards and environmental market demands

- Thermal storage
- High efficiency chillers
- Heater/chillers
- Water/ground source heat pumps
- Condensing boilers



Marketing (con't)

Design Innovation: making district energy part of a seamless infrastructure

- Innovative planning and design taking place now
- Incorporate components of District Energy into the overall master plan
- Designed with minimal impact on overall space utilization and aesthetic

Marketing (con't)

Future Opportunities: addressing long-term growth demands

- Central plant is developed on the East Bank
- Future needs can be addressed by adding additional capacities and capabilities



Marketing (con't)

- Peabody St Development
 - 1st and KVB
 - Potential ~1,100 tons and ~17,000 MBTUH hot water
 - Early stages of discussions
 - 4th and Lea Ave
 - Potential ~1,000 tons and no steam or hot water
 - Residential and retail
 - Re-evaluating development; on hold
- 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 and no steam
 - Apartment and retail development
 - Development on hold
 - 7th and Commerce
 - 660 tons and 14,500 pph steam
 - Hotel, restaurants and retail
 - Development on hold; awaiting executed CSA
 - 8th and Demonbreun
 - 1,300 tons and no steam
 - Hotel, restaurants and retail
 - Building design progressing with DES

8. *Capital Expenditure Update*

	Spent to End of FY23	FY24 Spending	Balance to Date (10/23/23)
R&I Projects	\$4,644,774	\$112,647	\$269,927
49116-DES Infrastructure Fund	\$5,011,324	\$140,490	\$4,222,057
Total	\$9,656,098	\$253,134	\$4,491,984

Capital Projects Review

Active Capital Projects – General & Marketing

- 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 – on hold pending Guthrie St. mods

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: 7th and Commerce Hotel – awaiting executed CSA
- DES 203: Printer’s and Banker’s Alley Building – building development on hold; intends to use DES CHW

Capital Projects Review

Active Capital Projects – Corrosion Repair/Prevention

- DES 178: MH 5 Repairs – corrosion/concrete/insulation repairs; piping insulation was completed. This project is now in close-out.
- DES 194: MH B4 Repairs – cleaning and coating of structural steel; re-insulation of piping; coating and the field applied insulation was completed during the 4th Qtr FY23; the insulation blankets did not fit properly and had to be modified by the manufacturer. All but one of the blankets were received and have been installed. The last blanket is on order.
- DES 211: AA Birch Tunnel and MH D Repairs – cleaning and coating of structural steel pipe and platform supports is needed. TEG is working on scope, specifications and drawings. Anticipate work to begin during the 3rd Qtr FY24.

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 3rd Qtr FY22; contractor delays; supply chain delays; all work except insulation and capping a 2” pipe is complete. Anticipate construction completion during 2nd Qtr FY24.
- DES 196: Exploratory Excav. & Cond. Leak Repair at MH 9 – involves condensate return piping replacement between MH 9 and MH 10 and additional work at MH 11; project was bid during the 4th Qtr FY23, only one bid was received, and pricing was prohibitive; TEG and CES met with an alternate contractor and received pricing much less than bid pricing. Work is scheduled to begin in October 2023.
- DES 198: MH18 Condensate Pump Replacement – construction began in September; commissioning expected in Q2FY24.

Capital Projects Review

Active Capital Projects – Repairs/Modifications

- DES 206: 7th Ave Tunnel Fan Replacement – 7th Ave Tunnel ventilation fan disintegrated while in operation; no injuries; new fan was ordered; work began during 1st Qtr FY24. Electrical equipment had to be re-ordered due to water damage. Anticipate project completion prior to end of 2nd Qtr FY24.
- DES 207: MH N1 Insulation – CES is installing most of the insulation under their Amendment 2 obligations with the balance being paid for by Metro; work scheduled to begin in October 2023 during lower humidity so piping will not be sweating during installation.
- DES 208: 2023 Steam Outage – several repairs are needed in the EGF and EDS which requires a steam outage; outage took place September 24-25, 2023; awaiting re-insulation of disturbed piping. Anticipate completion during 2nd Qtr FY24.

Capital Projects Review

Active Capital Projects – Repairs/Modifications

- DES 209: MH B2 Sump Pump Discharge Repair – sump pump discharge piping is either obstructed or damaged preventing evacuation of groundwater accumulation; obstruction/damage has been located using pipe tracing technology; work planned for October 2023.
- DES 210: MH C Sump Pump Installation – MH C is located adjacent to MTA bus station which complicates review and pumping manhole; TEG has obtained permission from MTA to use power from bus station for an electric sump pump in MH C; TEG investigating cost with DES-196 contractor because of proximity to work site; if cost is reasonable, project will be added to DES-196 as a change order.

Capital Projects Review

Active Capital Projects – Repairs/Modifications

- DES 212: MH 2 End Can Replacement – Steam piping end can assembly is corroded and requires replacement. TEG provided drawings and met with contractor to review work. Anticipate work to begin during 2nd Qtr FY24.
- DES 213: 4th, 7th & Broadway Tunnel Piping Slide Support Repairs – several pipe slides are damaged due to use over past 38+ years; TEG is working on repair/replacement scope and drawings. Anticipate bidding work during the 3rd Qtr FY24.
- DES 214: Chiller 2 R’newal – chiller 2 issues during quarter prompted review of machine; Trane recommended their R’newal program to replace compressors, motors, etc.; with 7-year warranty; work anticipated in Q2FY24.

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



9. Other Board Member Items

Election of Board Chair

*Operating Management Agreement Development
(current agreement expires end of FY25)*

10. Adjourn

- *Advisory Board Meeting Schedule*
- FY24 – 2nd Quarter Meeting – February 15, 2024
- FY24 – 3rd Quarter Meeting – May 16, 2024
- FY24 – 4th Quarter Meeting – August 15, 2024
- FY24 – 1st Quarter Meeting – November 21, 2024