



Metro Nashville
DISTRICT ENERGY SYSTEM

DES Advisory Board Meeting
Fourth Quarter FY22
August 18, 2022



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. FY22 Costs to Date and Budget
7. FY23 Budget
8. Marketing
9. Capital Projects Review & Status
10. Proposed Business Plan
11. Other Board Member Items
12. Adjourn

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

3. Customer Sales

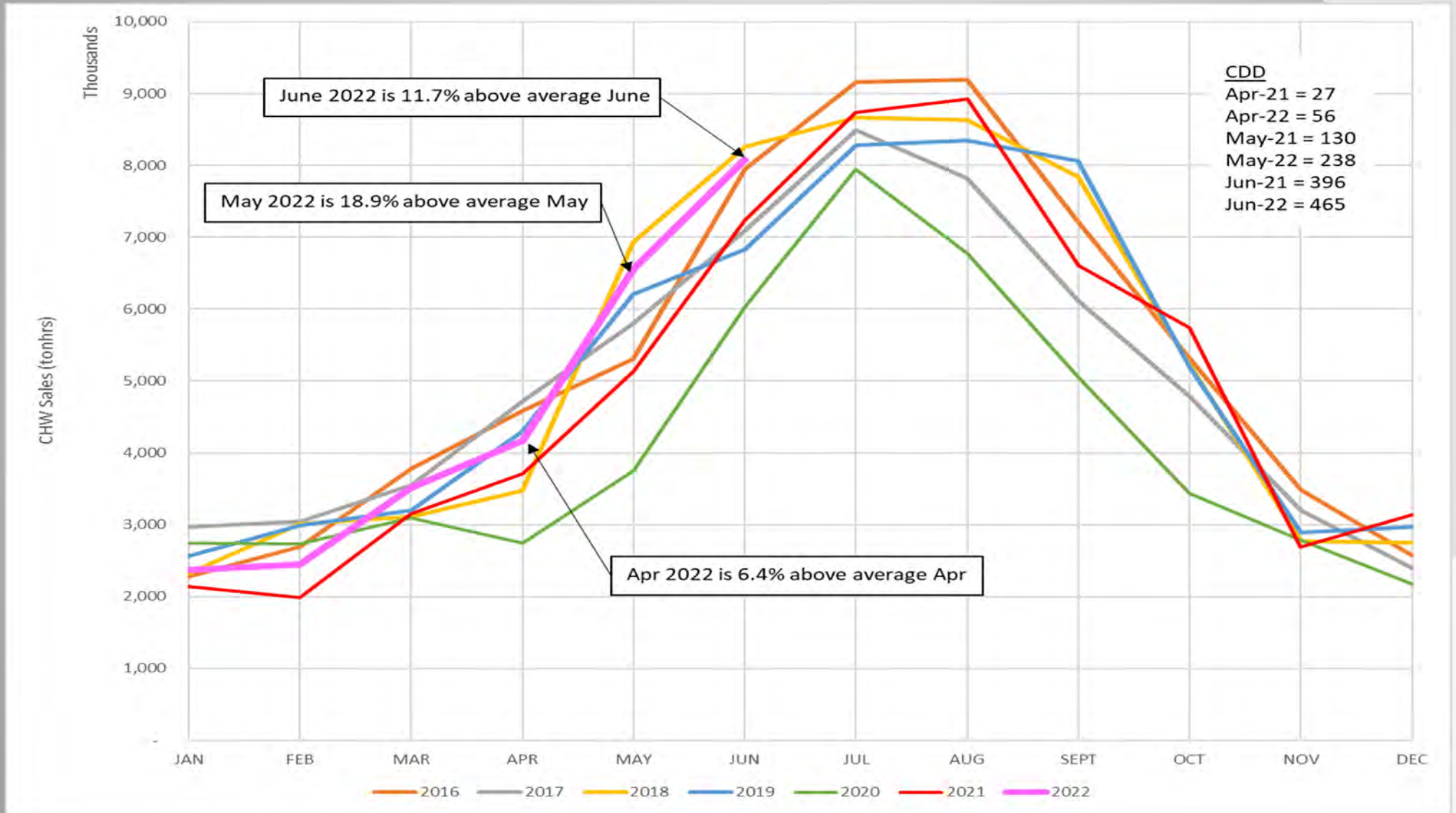
- ❖ There is only 1 customer in arrears more than 30 days
- ❖ Table 3: Customer Cost Comparison for the Previous 12 Months
- ❖ Figure 3A: Historic Chilled Water Sales
- ❖ Figure 3B: Historic Steam Sales

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

		Steam - Rolling 12 Month			Chilled Water - Rolling 12 Month		
		July 2020- June 2021	July 2021- June 2022	% Diff.	July 2020- June 2021	July 2021- June 2022	% Diff.
Private	Cost	\$ 1,275,565	\$ 1,682,089	31.87%	\$ 3,671,600	\$ 4,264,460	16.15%
	Usage (lbs or tonhrs)	82,674,621	92,527,925	11.92%	17,532,286	22,909,117	30.67%
State	Cost	\$ 1,765,493	\$ 2,106,815	19.33%	\$ 3,236,233	\$ 3,365,613	4.00%
	Usage (lbs or tonhrs)	113,128,646	105,967,830	-6.33%	13,019,176	13,888,176	6.67%
Metro	Cost	\$ 1,598,304	\$ 2,145,852	34.26%	\$ 4,198,317	\$ 4,805,921	14.47%
	Usage (lbs or tonhrs)	130,528,829	136,525,499	4.59%	20,985,842	26,461,938	26.09%
Aggregate	Cost	\$ 4,639,362	\$ 5,934,756	27.92%	\$11,106,149	\$12,435,994	11.97%
	Usage (lbs or tonhrs)	326,332,096	335,021,254	2.66%	51,537,304	63,259,231	22.74%
	Unit Cost	\$ 14.22	\$ 17.71	24.6%	\$ 0.215	\$ 0.197	-8.77%

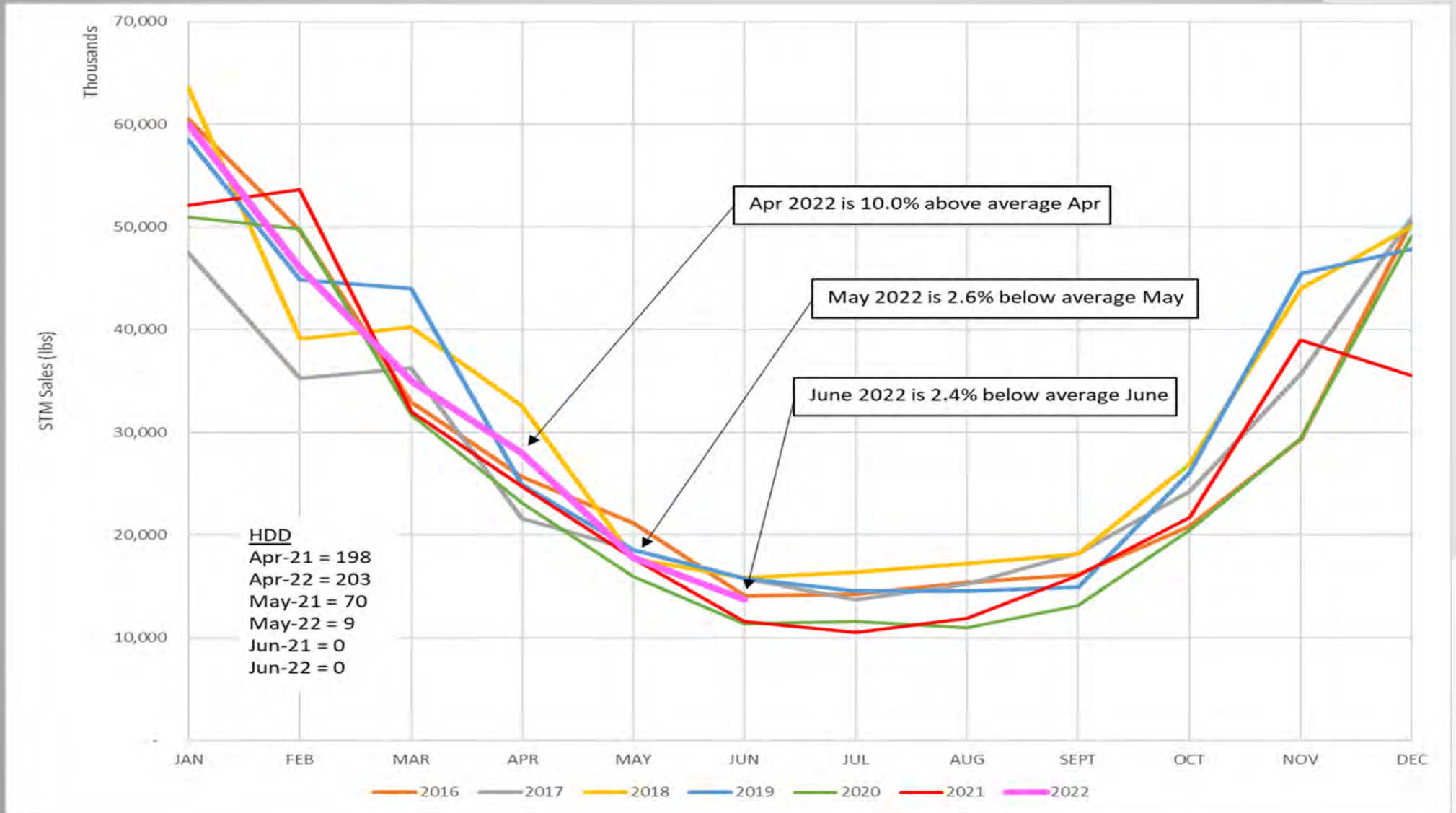
MFA, True-up, late fees and misc. are not included in values shown

Figure 3A. Historic Chilled Water Sales



Averages include the years 2016, 2017, 2018, 2019, 2020 and 2021.

Figure 3B. Historic Steam Sales






Averages include the years 2016, 2017, 2018, 2019, 2020 and 2021.

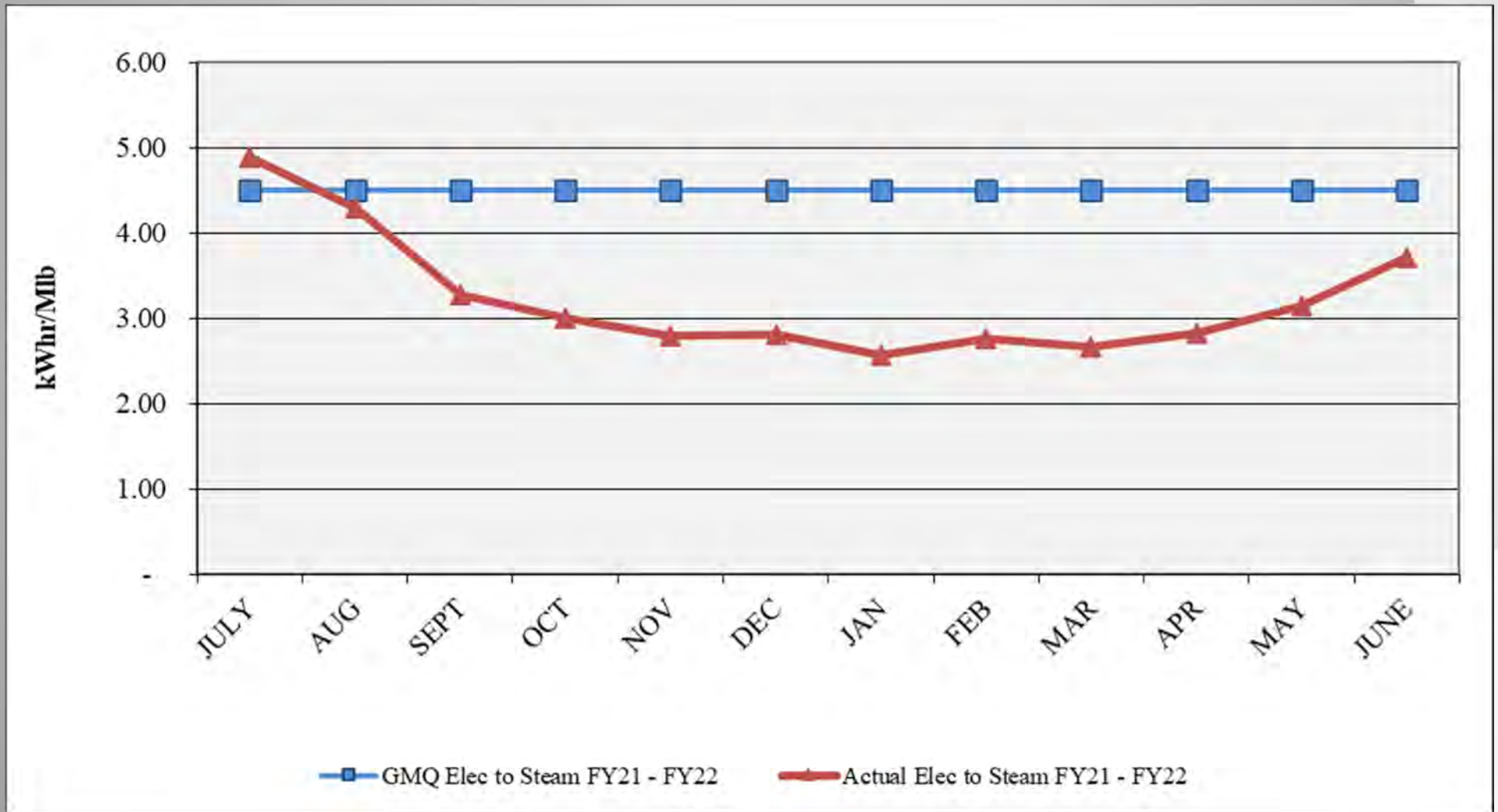
4. Review of DES Contractor Performance

Contractor (CES) has failed to meet all the new performance guarantees during the 1st, 2nd, 3rd and 4th Quarters FY22 and for all of FY21. CES is developing plan to address the failure to meet the new performance guarantees.

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

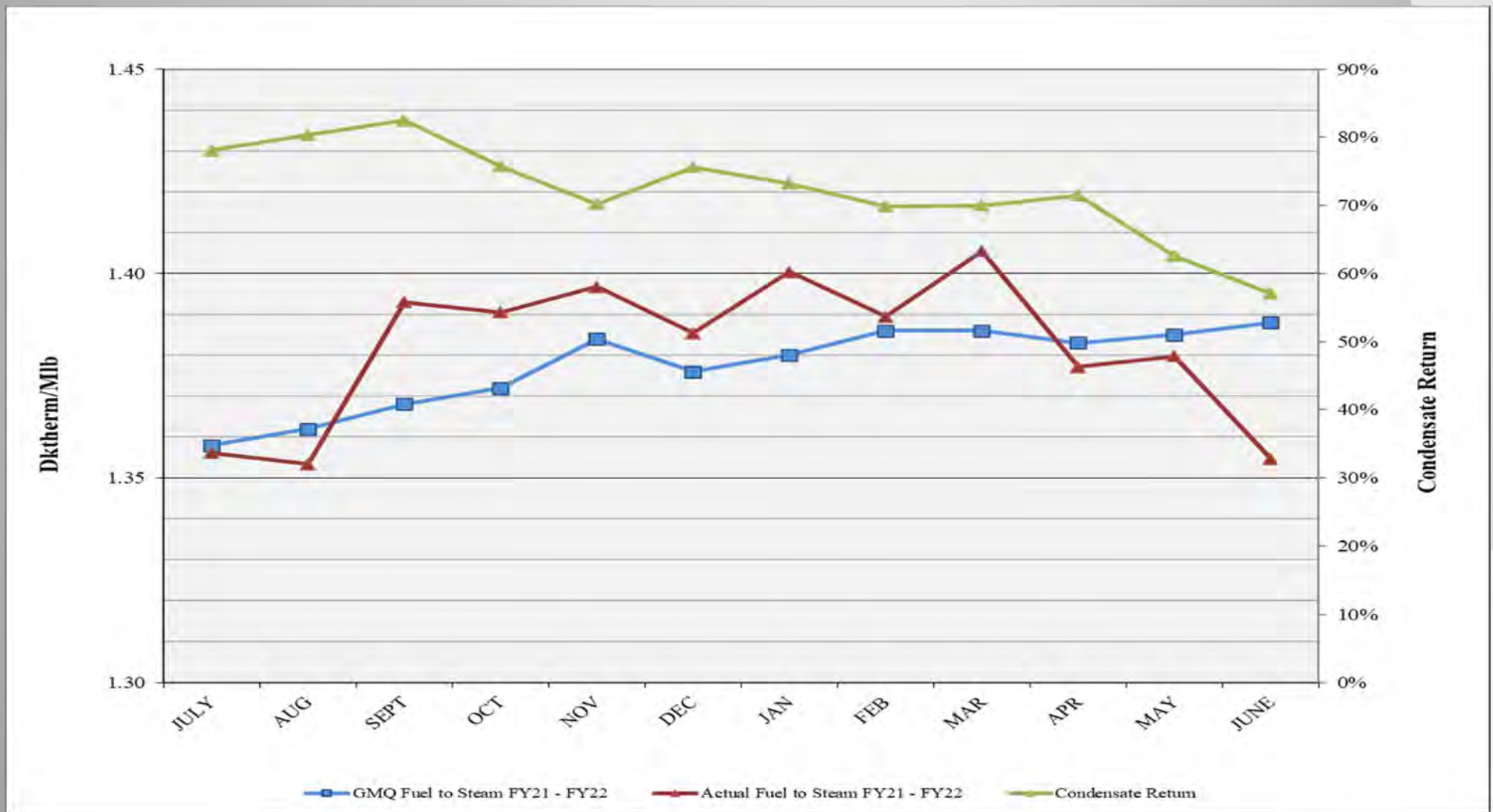
Performance Measurement FY22: Steam Electric Conversion ●



GMQ exceeded in July. FY22 FEA = \$12,007

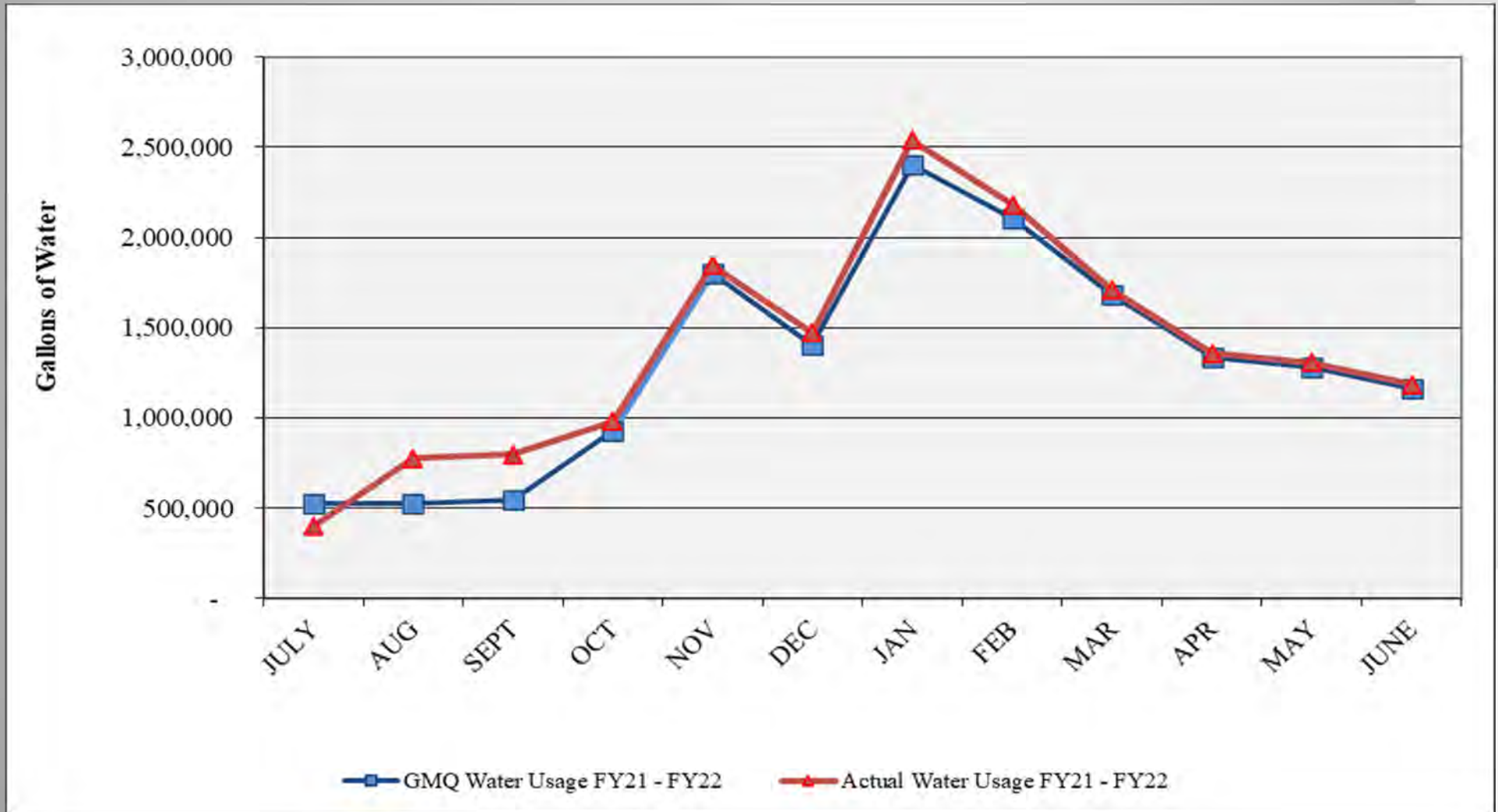
Performance Measurement FY22: Steam Plant Efficiency

● +



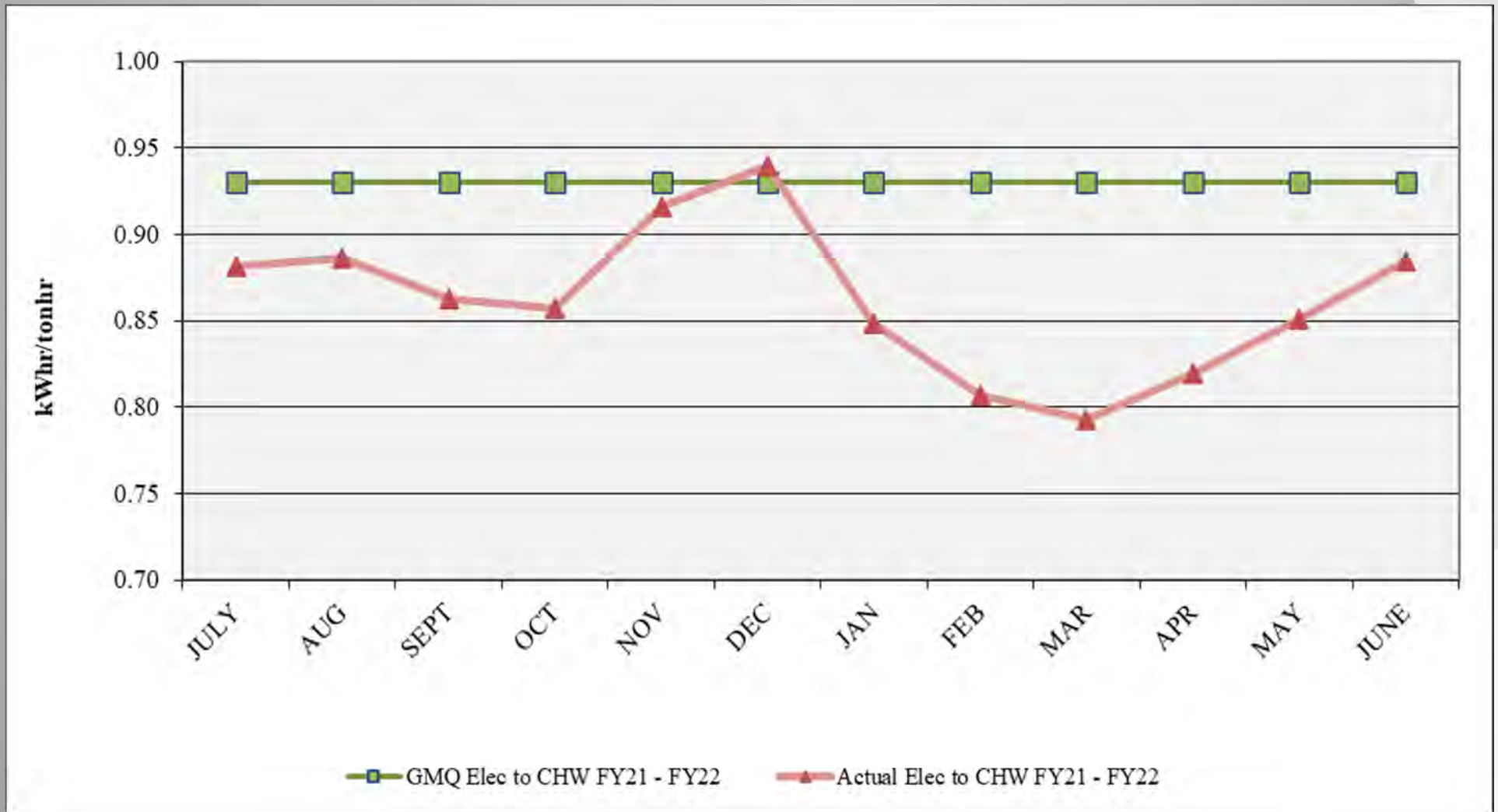
GMQ exceeded in Apr, May, Sept, Oct, Nov, Dec, Jan, Feb, and Mar. FY23 FEA = -\$19,344

Performance Measurement FY22: Steam Water Conversion ●



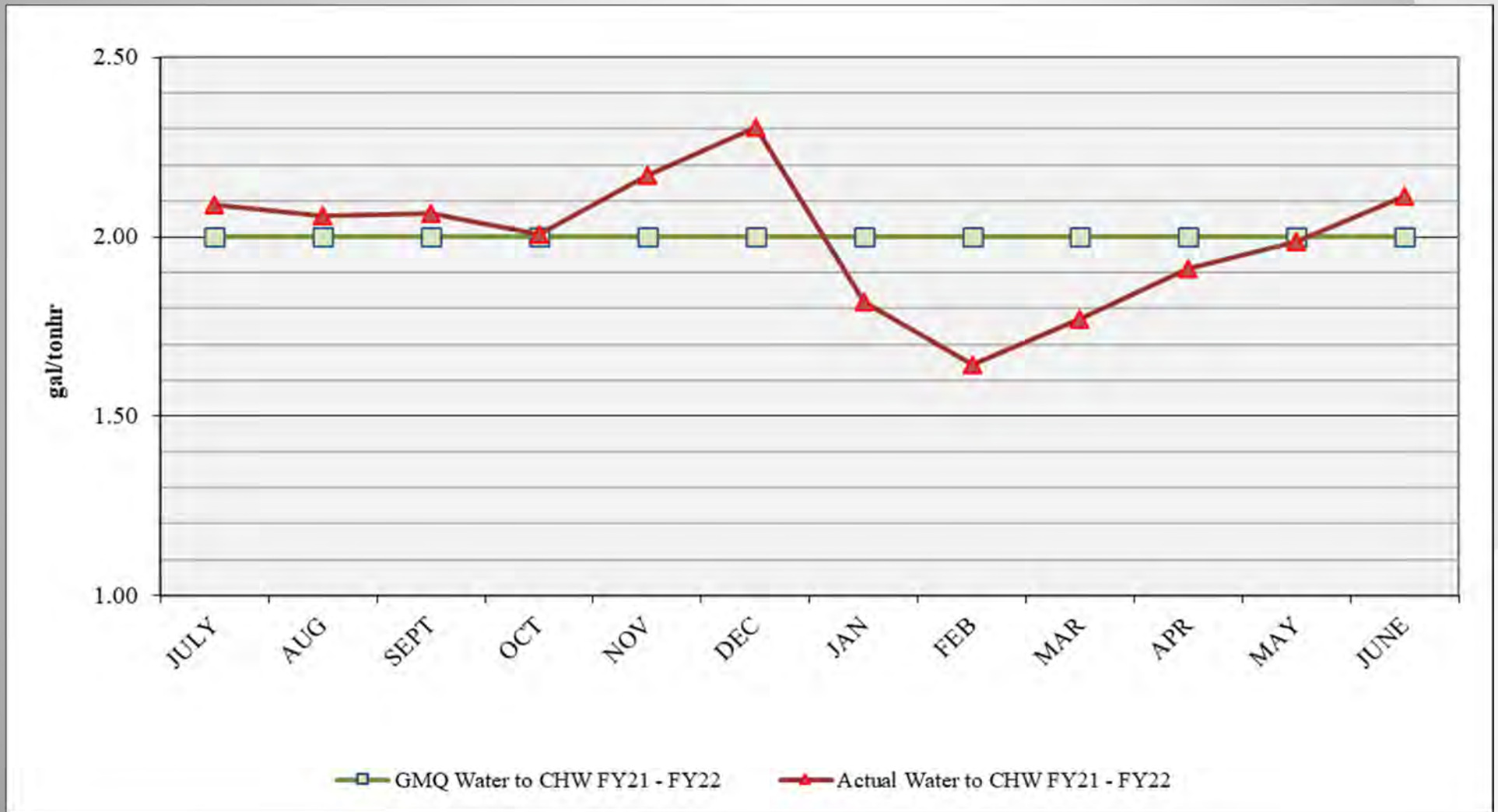
GMQ exceeded in all months of FY22 except July (5.5% above GMQ on average for fiscal year).
 FY23 FEA = \$-3,679

Performance Measurement FY22: CHW Electric Conversion ●



GMQ exceeded in Dec. FY23 FEA = \$86,014

Performance Measurement FY22: CHW Water Conversion



GMQ exceeded May, June, July, Aug, Sept, Oct, Nov, Dec and June. FY23 FEA = -\$13,283



Water Treatment

Q4FY22 Q3FY22 Q2FY22 Q1FY22

❖ 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 installed Q2FY23



E G F Walkthrough

Q4FY22 Q3FY22 Q2FY22 Q1FY22

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



EDS Walkthrough

Q4FY22 Q3FY22 Q2FY22 Q1FY22

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

5. Natural Gas Purchasing

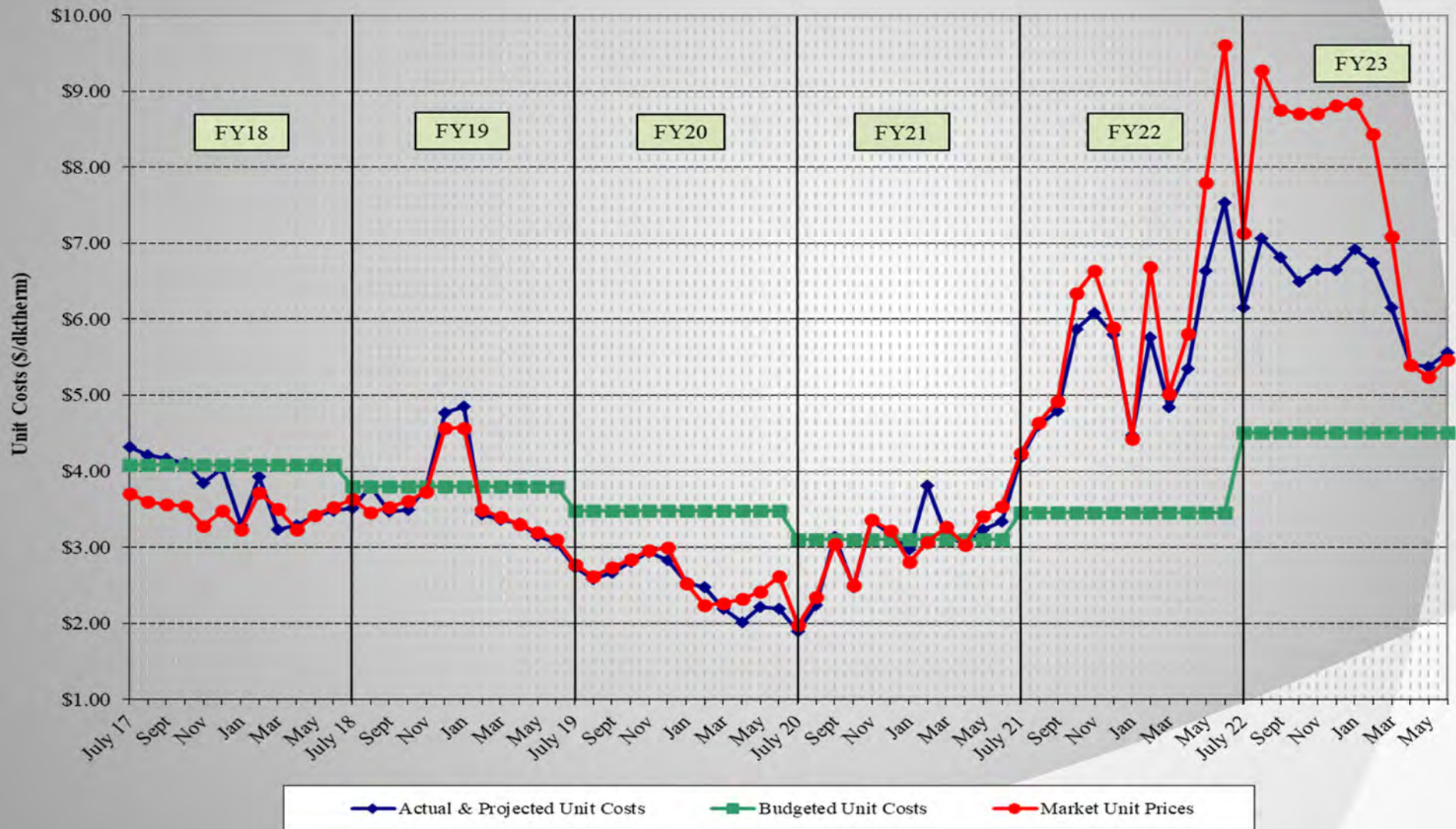
- ❖ Natural Gas Purchasing Review
 - ❖ Table 5: FY22 Gas Spending & Budget Comparison
 - ❖ Figure 5: Actual and Projected Fuel Cost Comparison

Table 5: FY22 Gas Spending & Budget Comparison

		Actual FY22 To June 30	Budget FY22	Percent Difference
Steam Sendout (Mlbs)		398,356	419,674	-5.1%
Fuel Use (Dth) (includes propane)	●	552,527	609,367	-9.3%
Plant Eff (Dth/Mlb)	●	1.387	1.452	-4.5%
Total Gas Cost (includes propane)	●	\$3,003,711	\$2,513,121	19.5%
Unit Cost of Fuel (\$/Dth)	●	\$5.436	\$3.330	63.2%

Excludes consultant fees and FEA; Includes transportation and actual propane costs and usages

Figure 5. Actual and Projected Fuel Cost Comparison



Currently hedging 56% of natural gas through FY23; FY22 futures include hedged price, NYMEX and transportation.



6. FY22 Costs to Date

Item	FY22 Budget	FY22 Actual to date	Percent of FY22 Budget
FOC's	\$ 3,890,100	\$ 3,890,115	100.00%
Pass Throughs			
Administrative Costs	\$ 459,600	\$ 399,187	86.86%
Chemicals	\$ 232,200	\$ 238,902	102.89%
R&I Fund Transfers	\$ 294,800	\$ 294,800	100.00%
Water/Sewer	\$ 751,500	\$ 982,611	130.75%
Fuel Base	\$ 2,115,186	\$ 2,115,186	100.00%
Fuel Contingency	\$ 516,814	\$ 952,132	184.23%
Electricity	\$ 6,329,500	\$ 5,088,647	80.40%
ORF Deposit	\$ -	\$ -	
Debt Service	\$ 5,083,200	\$ 5,093,951	100.21%
Total Expenses	\$ 19,672,900	\$ 19,055,531	96.86%
Total Revenues	\$ 19,042,200	\$ 18,469,561	96.99%
Metro Funding	\$ 630,700	\$ 630,700	100.00%

Actual Costs and Revenues to Date include FY21 True-up Items.



FY22 Budget

Item	FY21 Budget	FY22 Budget	Percent of FY21 Budget
FOC's	\$ 3,776,800	\$ 3,890,100	3.00%
Pass Throughs			
Administrative Costs	\$ 393,900	\$ 459,600	16.68%
Chemicals	\$ 260,700	\$ 232,200	-10.93%
R&I Fund Transfers	\$ 291,900	\$ 294,800	0.99%
Water/Sewer	\$ 624,000	\$ 751,500	20.43%
Fuel Base	\$ 2,001,900	\$ 2,115,186	5.66%
Fuel Contingency	\$ 431,900	\$ 516,814	19.66%
Electricity	\$ 6,130,100	\$ 6,329,500	3.25%
ORF Deposit	\$ -	\$ -	
Debt Service	\$ 5,098,000	\$ 5,083,200	-0.29%
Total Expenses	\$ 19,009,200	\$ 19,672,900	3.49%
Total Revenues	\$ 18,378,500	\$ 19,042,200	3.61%
Metro Funding	\$ 630,700	\$ 630,700	0.00%



7. 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%
Total Expenses	\$ 19,672,900	\$ 20,537,900	4.40%
Total Revenues	\$ 19,042,200	\$ 20,163,600	5.89%
Metro Funding	\$ 630,700	\$ 374,300	-40.65%

8. Marketing

Remaining Capacity for Sale (approximate)

- 2,429 tons of chilled water
- 24,622 pph of steam

IDEA Article

Potential Customers

- Service to Lot K (Peabody Union)
 - Site directly to the east of EGF
 - Declined to be a DES customer; Renewing negotiations
 - Guthrie Street
 - Blasting commenced early July

Marketing (con't)

- New Development North of KVB
 - Potential ~1,100 tons and ~15,000 pph
 - Early stages of discussions
- 1st and KVB
 - Potential ~1,100 tons and ~17,000 pph steam
 - Early stages of discussions
- Peabody St Development
- East Bank Update (DES 201)
- 2nd Ave and Peabody
 - Early stages of discussions

Marketing (con't)

- **Printer's and Banker's Alley**
 - ~600 tons Apartment and Retail Development
 - No interest in steam at this point
 - Building design progressing
- **7th and Commerce**
 - Potential ~700 tons and ~11,000 pph steam
 - Hotel, Restaurants and Retail
 - Building design progressing
- **8th and Demonbreun**
 - Early stages of discussions

9. Capital Expenditure Update

	Spent to End of FY21	FY22 Spending	Balance to Date (08/12/22)
R&I Projects	\$4,270,639	\$88,215	\$305,152
49116-DES Infrastructure Fund	\$2,824,820	\$1,687,141	\$902,473
Total	\$7,095,459	\$1,775,356	\$1,207,625

Capital Projects Review

Active Capital Projects – General & Marketing

- DES 133.1: Broadway Tunnel Damage Recovery - ongoing
- DES 139: Options Review - ongoing
- DES 163: Peabody Union – using project number to track time and expenses associated with Guthrie St development; blasting began in early July
- DES 192: Peabody St Developments – survey of routing down Peabody; TEG developing plan for expansion in that area
- 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 to be installed Q2FY23

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 – proposed hotel intends to be a customer; service will extend from 7th 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 – replacing signs at EGF with new, illuminated signs; to be completed 2nd Qtr FY23

Capital Projects Review

Active Capital Projects – Corrosion Repair/Prevention

- DES 143: MH N1 and N2 Insulation – structural steel to be cleaned/coated and piping insulation to be installed/added; rec'd pricing on MH N1 received and approved contract modification; anticipate construction to begin and be completed in 1st Qtr FY23.
- DES 154: MH K Repairs – corrosion/concrete repairs; base work and initial change orders complete; one additional change order to be done; anticipate work will be completed during 1st Qtr FY23
- DES 178: MH 5 Repairs – corrosion/concrete/insulation repairs; work began during 4th Qtr FY22; final item is re-insulate piping; anticipate work completion during 1st Qtr FY23 depending upon weather (heat)
- DES 179: MH 11 Repairs – work completed during 4th Qtr FY22; will open new project to address pipe corrosion; in close-out

Capital Projects Review

Active Capital Projects – Corrosion Repair/Prevention

- DES 188: 4th & Church Bldg Access Tunnel Repairs – work completed during 4th Qtr FY22; in close-out
- DES 189: MH 4 Structural Steel & Insulation Repair – corrosion and insulation repairs; insulation blankets ordered; corrosion work completed 4th Qtr FY22; awaiting insulation blankets; anticipate completion 1st Qtr FY23
- DES 193: MH 13 Pipe and Pipe Support Repairs – awaiting insulation repairs; anticipate work to be completed during 1st Qtr FY23
- DES 194: MH B4 Repairs – cleaning and coating of structural steel; re-insulation of piping; anticipate construction to begin during 1st Qtr FY23; anticipate work completion in 2nd Qtr FY23

Capital Projects Review

Active Capital Projects – Corrosion Repair/Prevention

- DES 197: MH 3 Coatings and Repairs – clean/coat structural steel completed during 4th Qtr FY22; awaiting insulation blankets; anticipate completion during 1st Qtr FY23.

Capital Projects Review

Active Capital Projects – Repairs/Modifications

- DES 177: MH B1 Platform & Ladder – bids rec'd; verbal award; dispute over CES mark-up
- DES 185: 5th Ave N Exploratory Excavation – work complete; cost substantiation approved; project closed during 4th Qtr FY22
- DES 187: Exploratory Excavation at MH 22B (Metro Public Library) – work complete; cost substantiation approved; project closed during 4th Qtr FY22
- 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; anticipate construction to start during 1st Qtr FY23

Capital Projects Review

Active Capital Projects – Repairs/Modifications

- DES 196: Exploratory Excav. & Cond. Leak Repair at MH 9 – received information on corroded piping at MH 11; in planning/design stage; anticipate bidding late 1st Qtr FY23 or early 2nd Qtr FY23
- DES 198: MH18 Condensate Pump Replacement – replace pumps with new configuration to improve reliability and automation; pumps ordered due to lead time with anticipated installation in Q2FY23
- DES 199: MH D3 Sparge Tube Addition – existing pipe support needs replacement due to corrosion and adding sparge tube because of steam hammer; CES obtained pricing; dispute over mark-up; anticipate construction to begin late 1st Qtr FY23

Constellation Energy Solutions,
LLC
System Operator

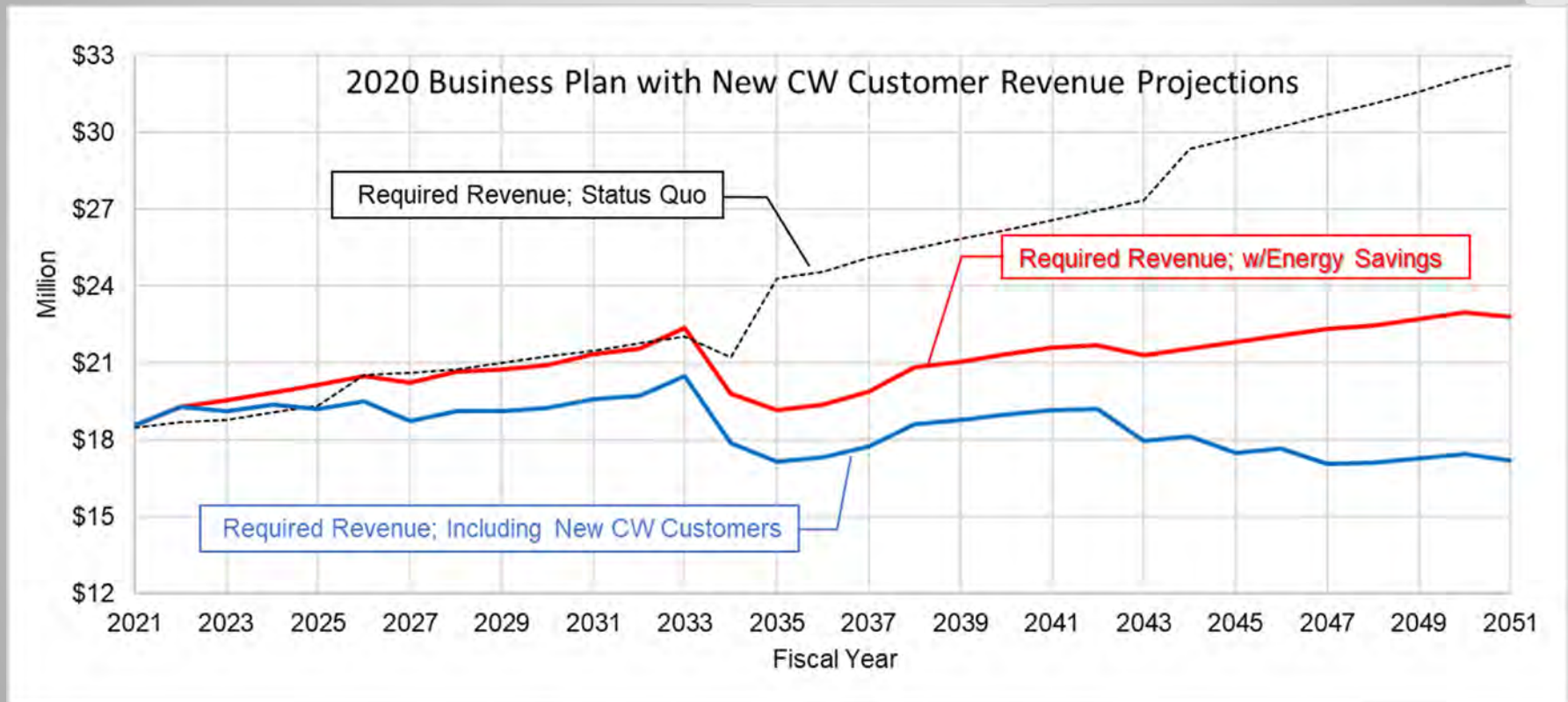


10. Proposed Business Plan

- ❖ Approving then implementing the Proposed Business Plan saves DES customers a projected \$190,000,000 over the next 30 years
 - ❖ Most savings come from Energy Saving Plan
 - ❖ Balance from additional customers
- ❖ Step 1: New Customer Contracts
- ❖ Step 2: Energy Savings Plan
- ❖ Step 3: New Customer Expansion

Executive Summary (cont.)

- ❖ The graph shows the overwhelming advantage of implementing the Proposed Business Plan



- ❖ As DES Project Administrator, we strongly recommend Metro adopt and implement the Proposed Business Plan

Step 1: Proposed Customer Contract Changes

- Eliminates direct pass throughs for energy costs and replaces it with a fixed efficiency for the energy to allow for the recovery of the capital costs associated with any energy savings program
- Doubles the CHW TIFS charge while allowing a credit for operating at higher Delta T than contract; no current credit
- Creates a variable CHW delivery temperature based on the time of year and outside air temperature instead of a fixed sendout temperature
- Detaches actual FOC and Debt Service payments from customer capacity charges and replaces it with a fixed contract capacity charge that is allowed to escalate



Step 2: Energy Saving Plan

- Chiller Replacement
 - Replace with potential grant or self-funded
 - 5-year simple return from electrical energy savings
 - Annual estimated avoided electric 5,600 MWhrs
 - Annual estimated avoided CO2 emissions 1,850 tons
- Additional savings opportunities include:
 - Thermal Storage
 - Condensing Economizer
 - O2 Trim
 - Cooling Tower Replacement
 - Variable Speed Drives
 - Controls Modifications
 - Hydraulic Balancing

Capital Budget Summary

Project	FY2023	FY2024	FY2025	FY2026	FY2027	FY2028	FY2029	FY2030	FY2031	FY2032
TES/High Eff Chlr/CHW Controls	\$ 11,177					\$ 5,571			\$ 7,891	
CND Econ/Blr Renovations/STM Controls	\$ 625									
Pipeline Extension/Cust. Connection	\$ 3,531		\$ 12,761		\$ 14,494		\$ 3,825		\$ 4,057	
Parking Lot Investigation/Expansion	\$ 289	\$ 500								
Cust Decoupling/Connection Renovations	\$ 732	\$ 5,127	\$ 129	\$ 140	\$ 128	\$ 117	\$ 120	\$ 124	\$ 128	\$ 131
CHW and Cond Leak Repairs	\$ 589	\$ 507	\$ 518	\$ 533	\$ 549	\$ 318	\$ 328	\$ 338	\$ 348	\$ 358
Misc EDS Repairs and Improvements	\$ 1,260	\$ 860	\$ 749	\$ 851	\$ 783	\$ 690	\$ 683	\$ 675	\$ 667	\$ 657
Totals	\$18,204	\$6,994	\$14,158	\$1,524	\$15,954	\$6,696	\$4,956	\$1,137	\$13,091	\$1,146

All values in thousands of dollars.

Capital Budget Summary

Project	FY2033	FY2034	FY2035	FY2036	FY2037	FY2038	FY2039	FY2040	FY2041	FY2042
TES/High Eff Chlr/CHW Controls		\$ 8,886			\$ 7,340					
CND Econ/Blr Renovations/STM Controls		\$ 2,750			\$ 3,329			\$ 4,030		
Pipeline Extension/Cust. Connection					\$ 4,845			\$ 5,294		
Parking Lot Investigation/Expansion										
Cust Decoupling/Connection Renovations	\$ 135	\$ 139	\$ 144	\$ 148	\$ 152	\$ 157	\$ 162	\$ 166	\$ 171	\$ 177
CHW and Cond Leak Repairs	\$ 369	\$ 380	\$ 391	\$ 403	\$ 415	\$ 428	\$ 441	\$ 454	\$ 467	\$ 481
Misc EDS Repairs and Improvements	\$ 646	\$ 633	\$ 620	\$ 605	\$ 588	\$ 570	\$ 551	\$ 529	\$ 506	\$ 481
Totals	\$1,150	\$12,789	\$1,155	\$1,156	\$16,669	\$1,155	\$1,153	\$10,473	\$1,145	\$1,139

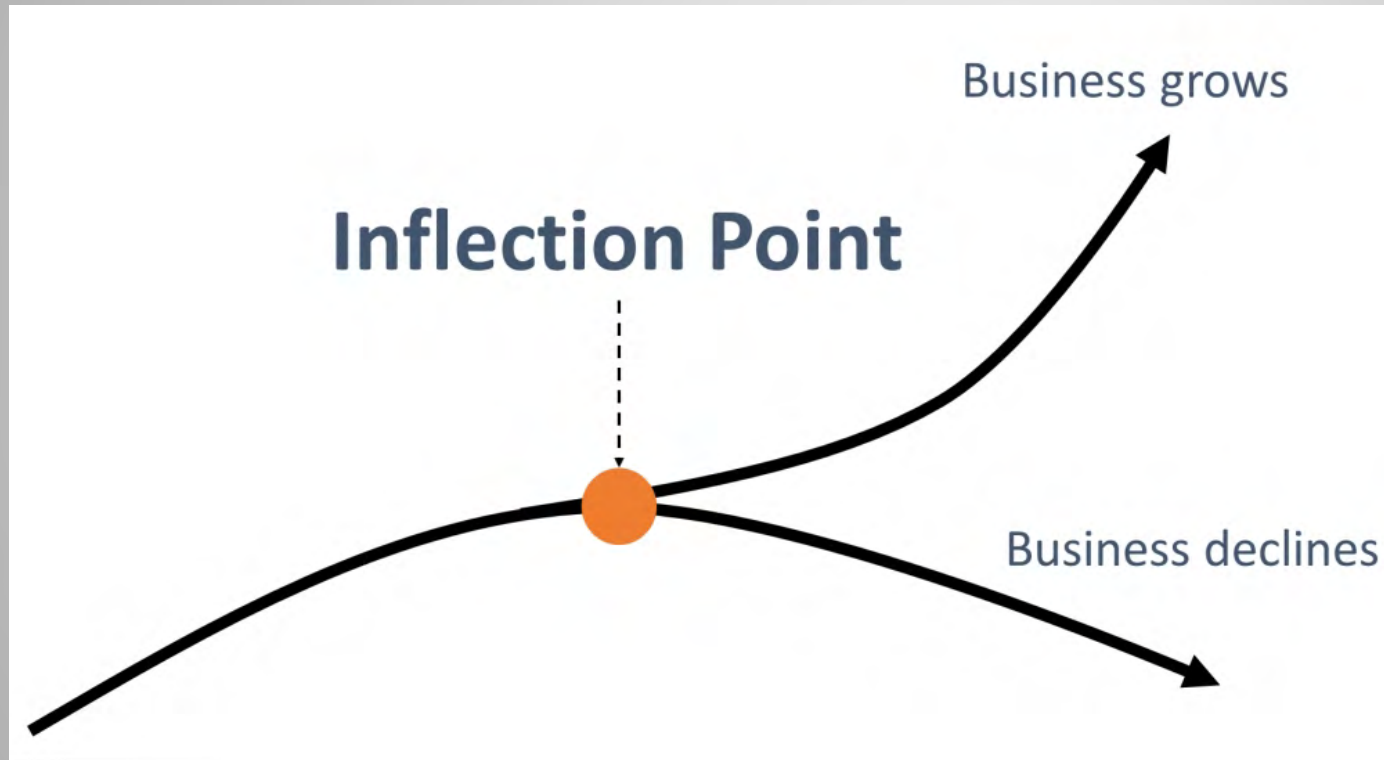
All values in thousands of dollars.

Step 3: New Customer Expansion

- With the new chiller(s):
 - Lower cost of production
 - Greater savings for customers (DES becomes more competitive)
 - Additional capacity
 - Lower operating and maintenance cost
 - Life extension
- Expansion to west and south:
 - New developments planned along Peabody corridor
 - New pipelines with chilled water and hot water
 - Lower cost to install and maintain without steam distribution, vaults, etc.

Conclusion:

- DES is at an inflection point.



- We recommend the Board pass a resolution to recommend adoption of the plan.

11. Other Board Member Items

TEG contract extended through October 26th

RFQ for DES PA proposal deadline was June 21, 2022. Evaluation of proposals is ongoing. No information on selection to date.

Michael Adcock with 5th and Broadway replaces Chris Proctor as the Private ISC Board Member Representative.

12. Adjourn

- Advisory Board Meeting Schedule
- FY23 – 1st Quarter Meeting – November 17, 2022
- FY23 – 2nd Quarter Meeting – February 16, 2023
- FY23 – 3rd Quarter Meeting – May 18, 2023
- FY23 – 4th Quarter Meeting – August 17, 2023