



Metro Nashville
DISTRICT ENERGY SYSTEM

DES Customer Meeting

Spring FY16

May 26, 2016



Agenda

1. Welcome!
2. Historic Customer Expenses
3. Historic Customer Consumption
4. Historic System Efficiency
5. Natural Gas Pricing
6. DES FY16 and FY17 Budgets
7. Chilled Water Delta T Review
8. DES Projects
9. Questions and Answers
10. Adjourn



1. Welcome DES Customers!



2. Historic Customer Expenses

- ❖ Figure 2A. Historic CHW Expenses
- ❖ Figure 2B. Historic Steam Expenses
- ❖ Table 2. Rolling Twelve Month Expenses

Figure 2A. Historic CHW Expenses

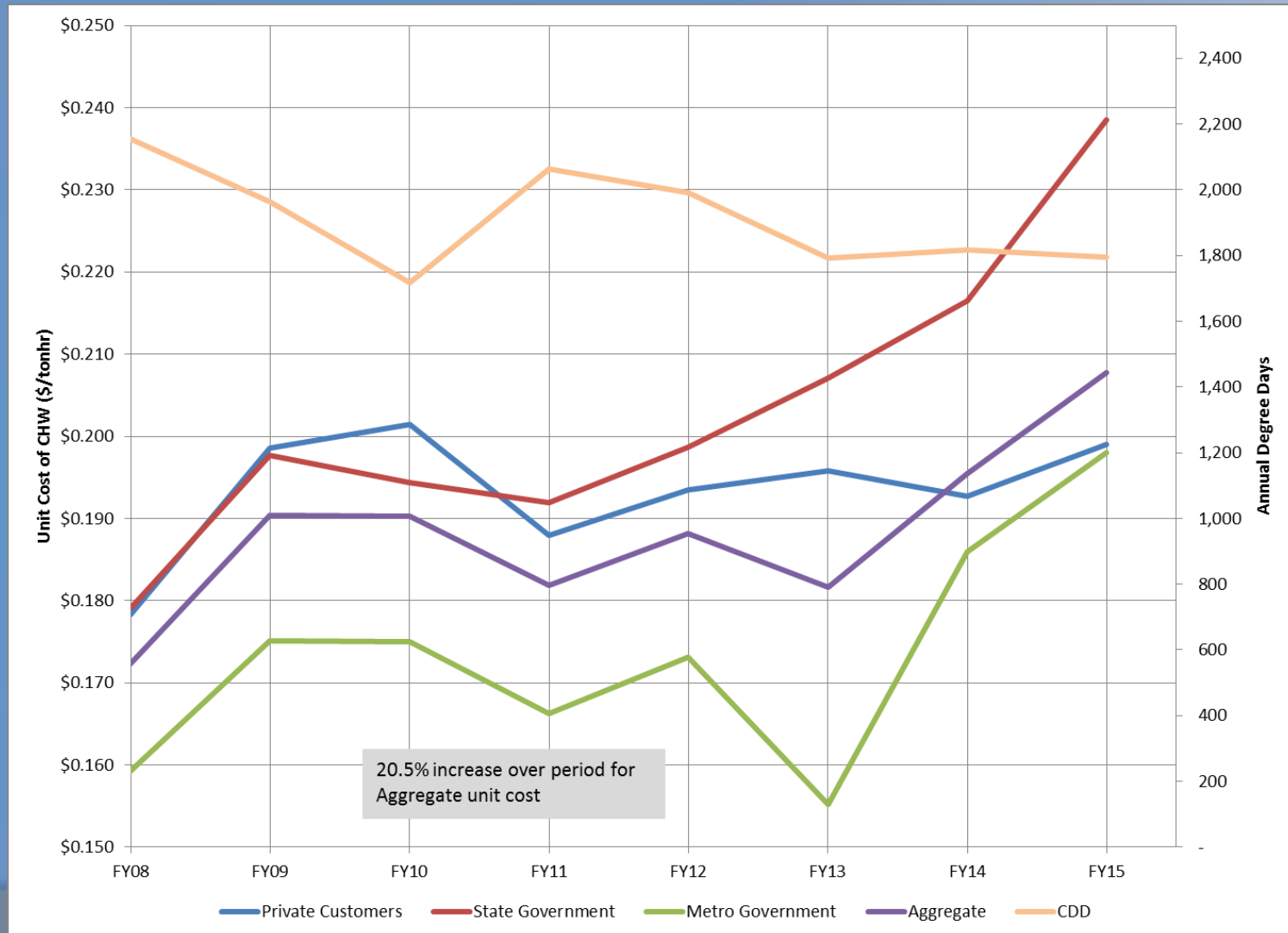


Figure 2B. Historic Steam Expenses

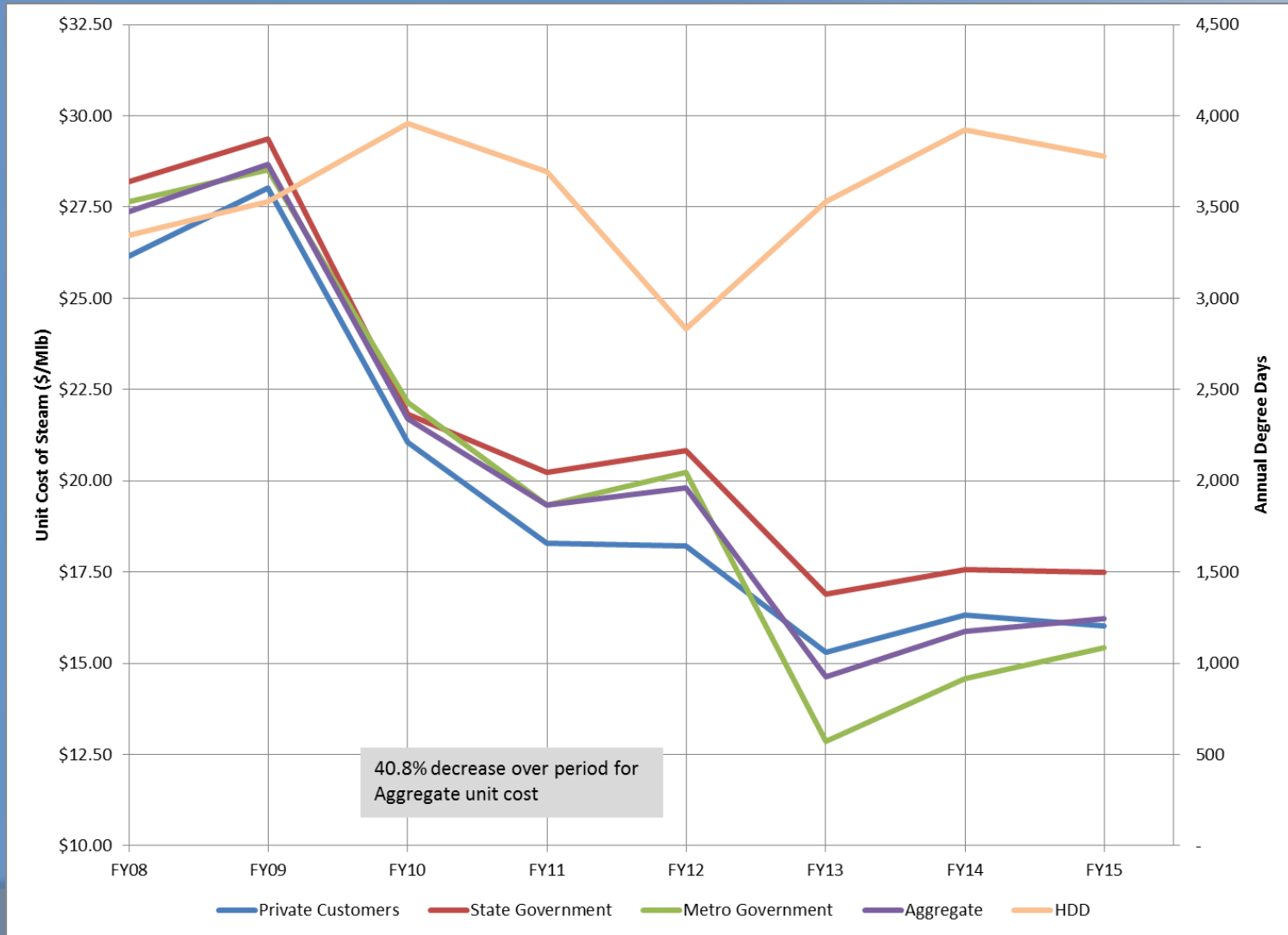


Table 2. Rolling Twelve Month Expenses

		Steam - Rolling 12 Month			Chilled Water - Rolling 12 Month		
		Apr 2014 - Mar 2015	Apr 2015 - Mar 2016	% Diff.	Apr 2014 - Mar 2015	Apr 2015 - Mar 2016	% Diff.
Private	Cost	\$ 1,515,809	\$ 1,287,404	-15.07%	\$ 3,455,202	\$ 3,574,798	3.46%
	Usage (lbs or tonhrs)	96,247,402	80,565,859	-16.29%	16,957,135	18,321,724	8.05%
	Unit Cost	\$ 15.75	\$ 15.98	1.5%	\$ 0.204	\$ 0.195	-4.2%
State	Cost	\$ 2,100,201	\$ 1,736,949	-17.30%	\$ 3,316,303	\$ 3,378,814	1.88%
	Usage (lbs or tonhrs)	119,743,240	93,972,626	-21.52%	13,916,501	14,797,466	6.33%
	Unit Cost	\$ 17.54	\$ 18.48	5.4%	\$ 0.238	\$ 0.228	-4.2%
Metro	Cost	\$ 2,581,398	\$ 2,067,782	-19.90%	\$ 5,550,143	\$ 5,518,475	-0.57%
	Usage (lbs or tonhrs)	170,815,595	135,787,174	-20.51%	28,295,720	28,086,160	-0.74%
	Unit Cost	\$ 15.11	\$ 15.23	0.8%	\$ 0.196	\$ 0.196	0.2%
Aggregate	Cost	\$ 6,326,148	\$ 5,213,973	-17.58%	\$ 12,321,648	\$ 12,581,581	2.11%
	Usage (lbs or tonhrs)	392,641,651	316,166,463	-19.48%	59,169,356	61,783,199	4.42%
	Unit Cost	\$ 16.11	\$ 16.49	2.4%	\$ 0.208	\$ 0.204	-2.21%

MFA not included in values shown

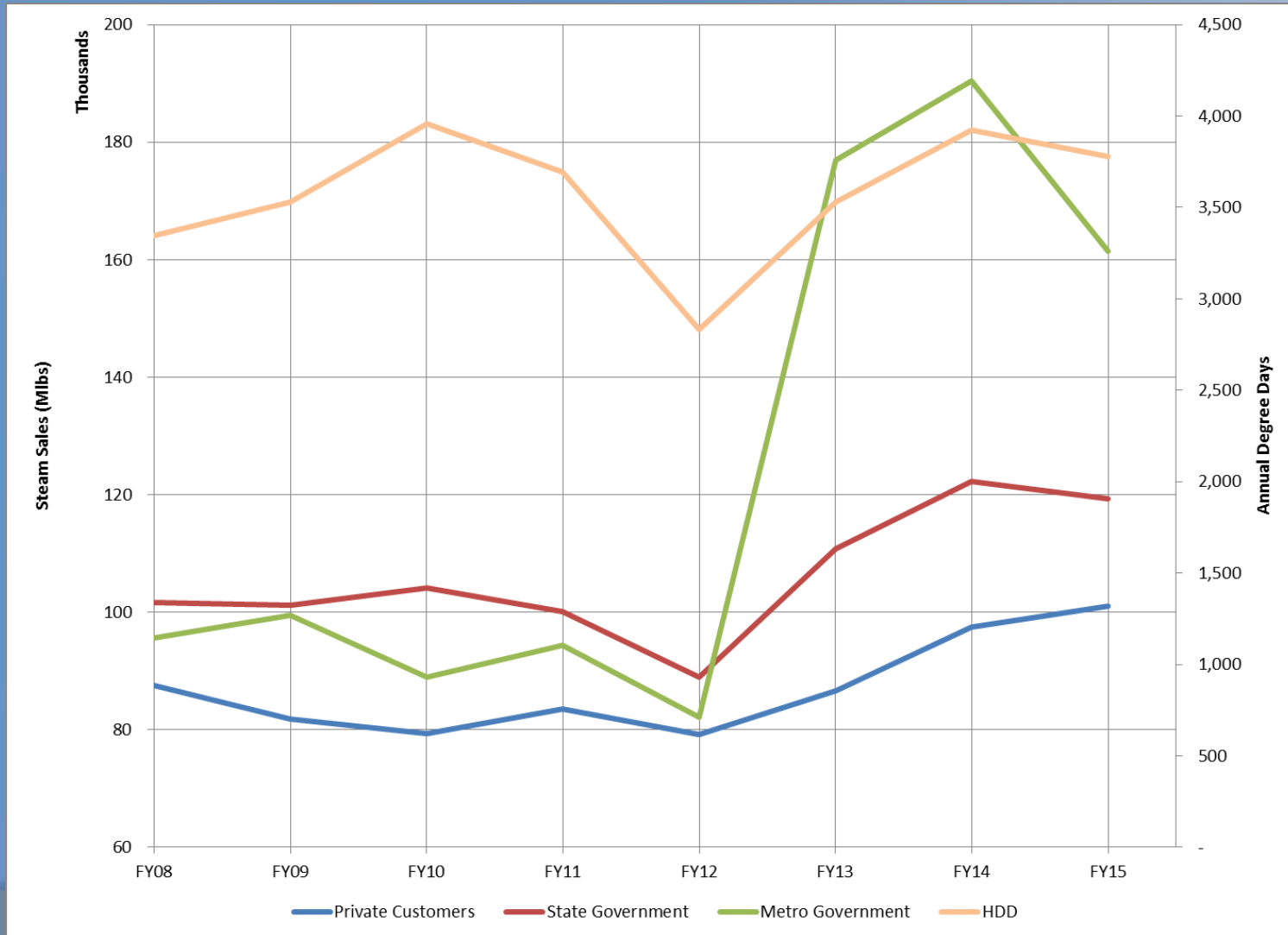
3. Historic Customer Consumption

- ❖ Figure 3A. Historic CHW Consumptions
- ❖ Figure 3B. Historic Steam Consumptions

Figure 3A. Historic CHW Consumptions



Figure 3B. Historic Steam Consumptions





4. *Historic System Efficiency*

- ❖ Figure 4A. Historic CHW Water Usages
- ❖ Figure 4B. Historic CHW Electric Efficiency
- ❖ Figure 4C. Historic Steam Fuel and Electric Efficiencies
- ❖ Figure 4D. Historic Steam Water Usage and Condensate Return

Figure 4A. Historic CHW Water Usages

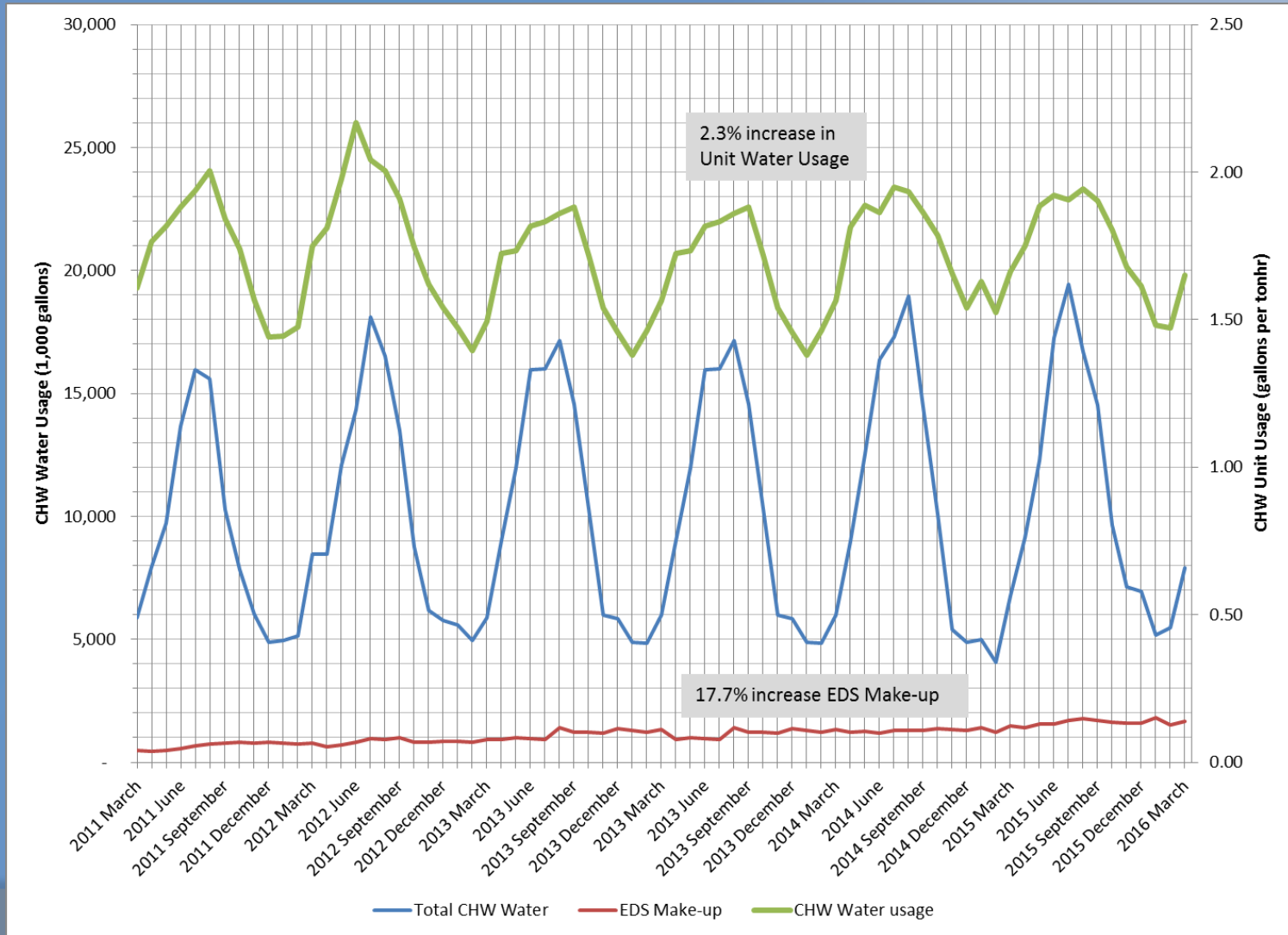


Figure 4B. Historic CHW Electric Efficiency

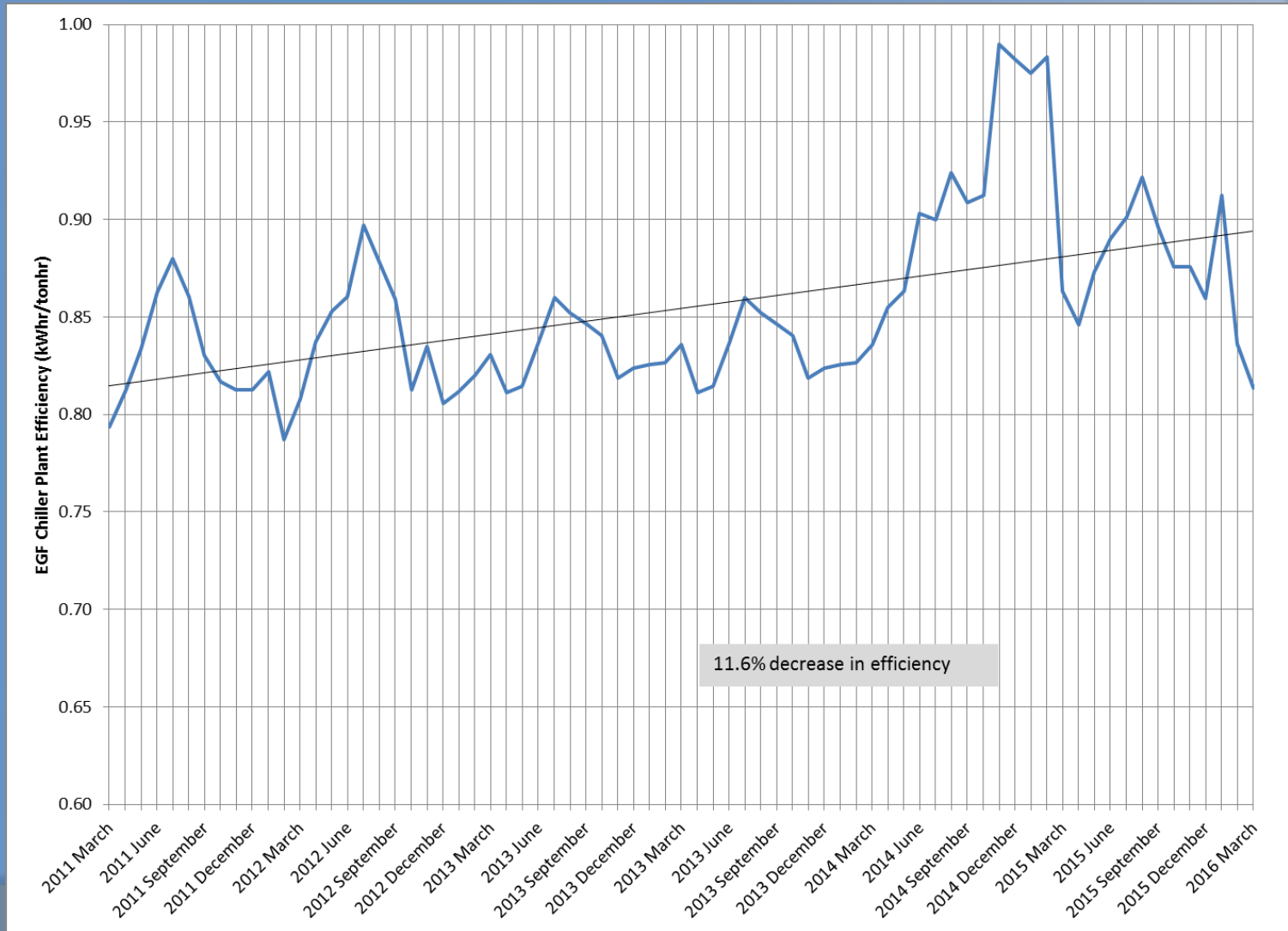


Figure 4C. Historic Steam Fuel and Electric

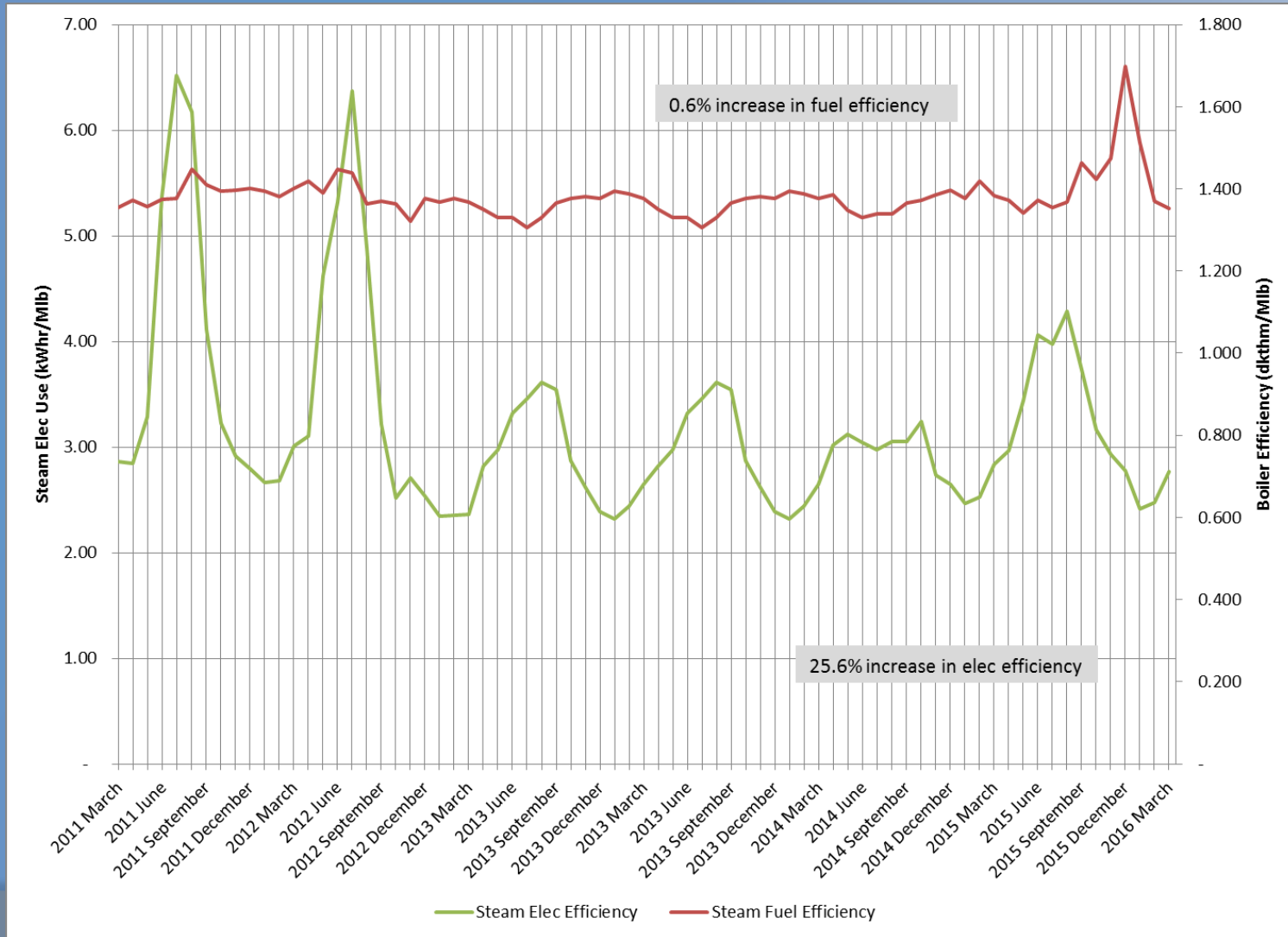
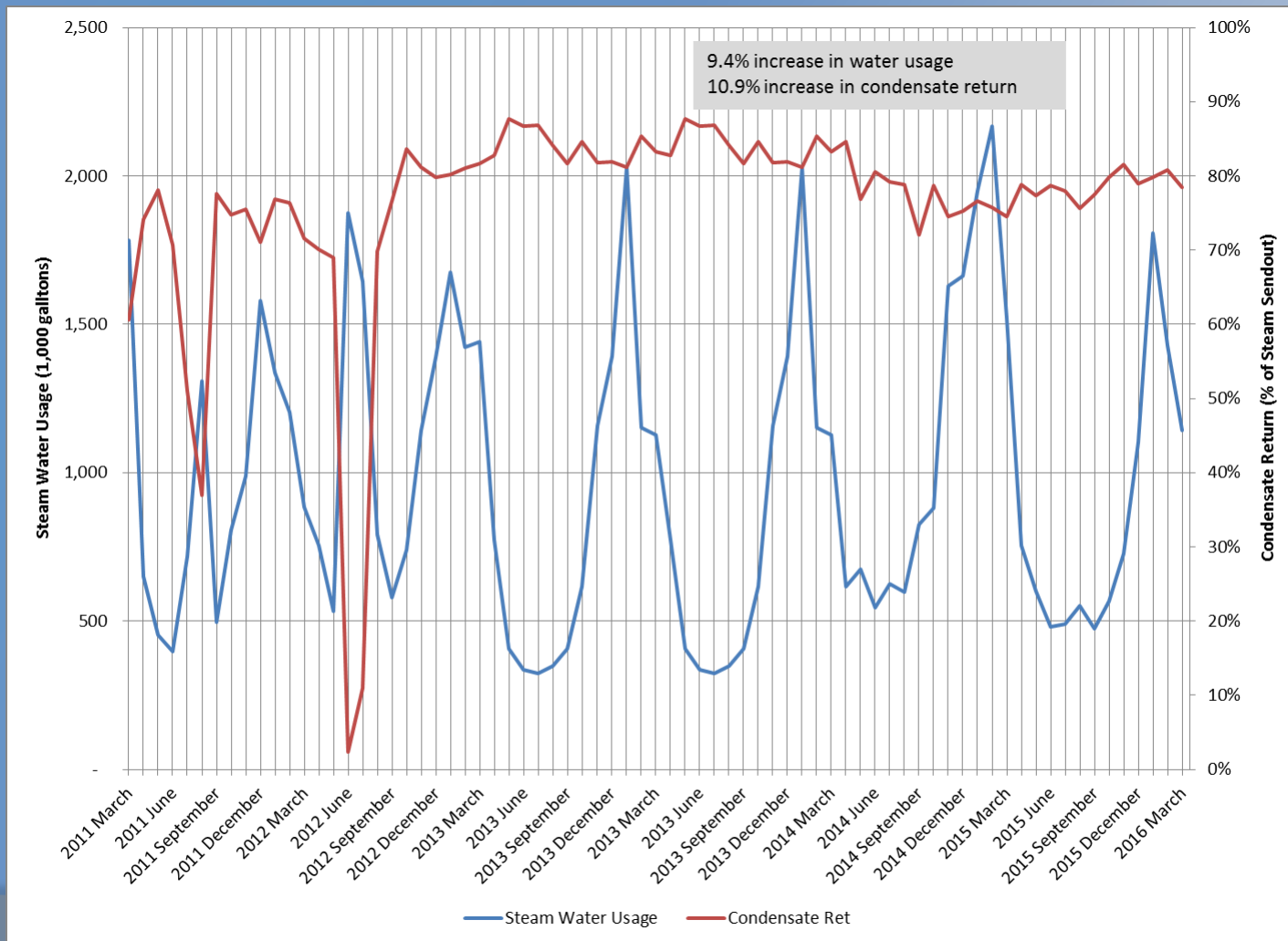


Figure 4D. Historic Steam Water Usage and Condensate Return



5. Natural Gas Pricing

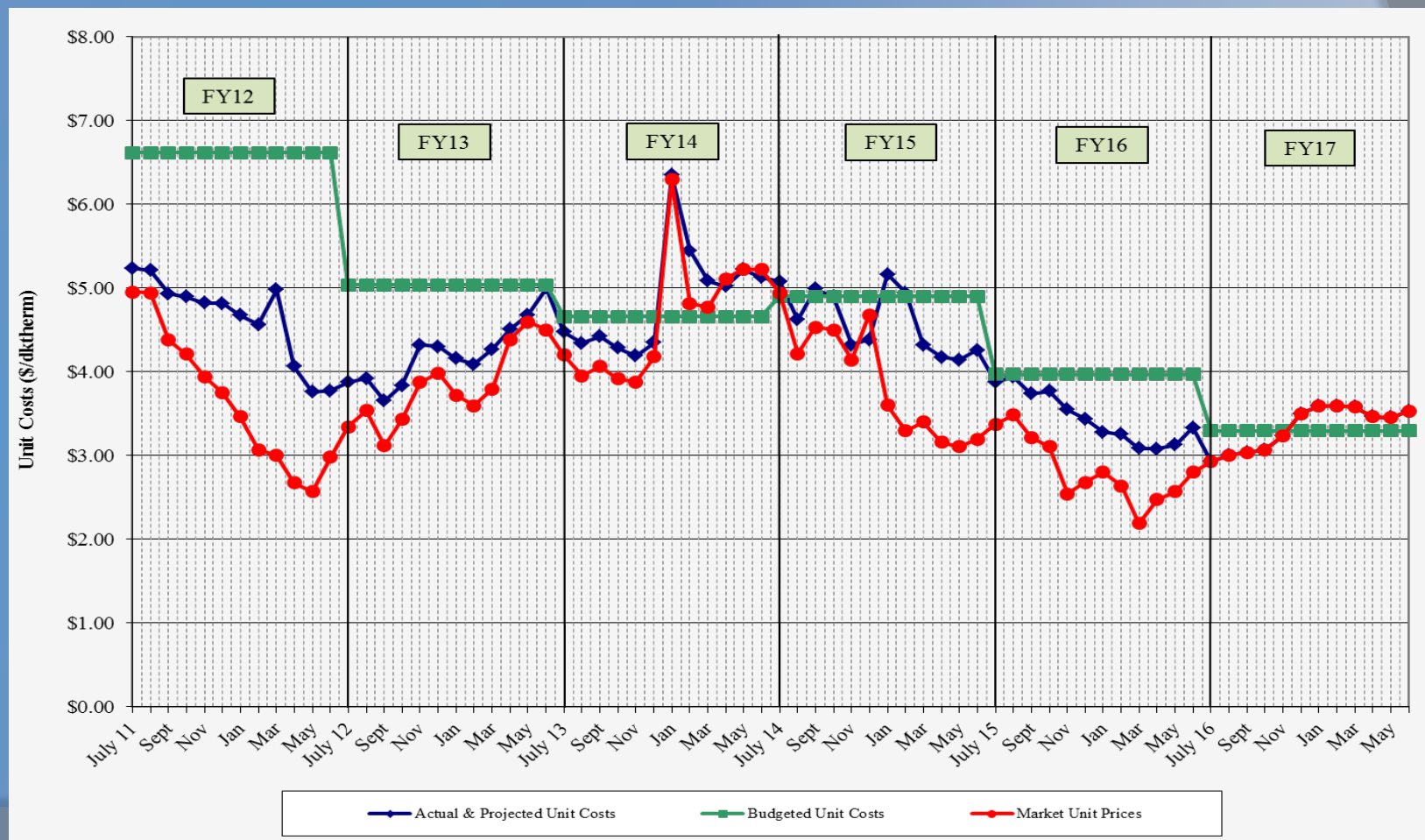


Table 5: FY16 Gas Spending & Budget Comparison

	Actual FY16 To date (Mar 31)	Budget FY16	Percent Difference
Steam Sendout (Mlbs)	310,151	395,634	-21.6%
Fuel Use (Dth) (includes propane)	452,601	542,810	-16.6%
Plant Eff (Dth/Mlb)	1.459	1.372	6.3%
Total Gas Cost (includes propane)	\$1,649,724	\$2,658,138	-37.9%
Unit Cost of Fuel (\$/ Dth)	\$3.645	\$4.174	-12.7%

Excludes consultant fees and FEA and budget contingency;

Includes transportation and propane costs (\$70,000 pre-purchased propane)

6. *DES FY16 and FY17 Budgets*

- ❖ Table 6A. DES FY16 Costs to Date
- ❖ Table 6B. DES FY17 Budget

Table 6A. DES FY16 Costs to Date

Item	FY15 Actual	FY16 Budget	FY16 Actual to date	Percent of FY16 Budget
FOC's	\$ 4,532,100	\$ 4,668,200	\$ 3,399,100	72.81%
Pass Throughs				
Non-Energy	\$ 1,249,000	\$ 1,069,500	\$ 791,300	73.99%
Water/Sewer	\$ 509,000	\$ 745,400	\$ 402,600	54.01%
Natural Gas Base	\$ 2,897,000	\$ 2,832,858	\$ 1,656,300	58.47%
Natural Gas Contingency	\$ -	\$ 555,142	\$ -	0.00%
Electricity	\$ 5,459,700	\$ 6,545,700	\$ 4,103,000	62.68%
ORF Deposit	\$ 600	\$ -	\$ -	
Debt Service	\$ 5,646,000	\$ 5,565,900	\$ 4,033,700	72.47%
Total Expenses	\$ 20,293,400	\$ 21,982,700	\$ 14,386,000	65.44%
Total Revenues	\$ 18,425,800	\$ 20,188,200	\$ 13,396,900	66.36%
Metro Funding Amount	\$ 1,867,600	\$ 1,794,500	\$ 1,794,000	99.97%



Table 6B. DES FY17 Budget

Item	FY16 Budget	FY17 Budget	Percent Change
FOC's	\$ 4,668,200	\$ 4,668,000	0.00%
Pass Throughs			
Non-Energy	\$ 1,069,500	\$ 1,103,500	3.18%
Water/Sewer	\$ 745,400	\$ 640,200	-14.11%
Natural Gas Base	\$ 2,832,858	\$ 2,155,654	-23.91%
Natural Gas Contingency	\$ 555,142	\$ 570,846	2.83%
Electricity	\$ 6,545,700	\$ 6,093,800	-6.90%
ORF Deposit	\$ -	\$ -	N.A.
Debt Service	\$ 5,565,900	\$ 5,525,000	-0.73%
Total Expenses	\$ 21,982,700	\$ 20,757,000	-5.58%
Total Revenues	\$ 20,188,200	\$ 19,035,000	-5.71%
Metro Funding Amount	\$ 1,794,500	\$ 1,722,000	-4.04%

7. Chilled Water Delta T Review

- ❖ Historic Decline in Customer Delta T's
- ❖ Low Delta T's:
 - ❖ Increase Customer In-building Pumping Costs
 - ❖ Increase DES Pumping Costs
 - ❖ Decreases Chiller Performance
 - ❖ Increase DES Chiller Electric Costs (~\$20,000 per chiller in demand costs)
- ❖ Customer TIFS
- ❖ Building Side Water Chemistry/Coil Cleaning

Customer TIFS

	State TIFS	Metro TIFS	Private TIFS	Totals
FY07	\$ 13,997	\$ 7,061	\$ 4,912	\$ 25,970
FY08	\$ 52,421	\$ 22,810	\$ 31,830	\$ 107,061
FY09	\$ 53,165	\$ 25,188	\$ 21,022	\$ 99,374
FY10	\$ 56,182	\$ 30,929	\$ 18,318	\$ 105,429
FY11	\$ 68,228	\$ 36,007	\$ 24,372	\$ 128,607
FY12	\$ 65,471	\$ 35,969	\$ 29,201	\$ 130,641
FY13	\$ 66,074	\$ 35,496	\$ 46,829	\$ 148,399
FY14	\$ 45,327	\$ 28,873	\$ 39,558	\$ 113,757
FY15	\$ 68,199	\$ 32,601	\$ 27,485	\$ 128,285
FY16	\$ 43,624	\$ 42,330	\$ 30,541	\$ 116,495
Cumulative	\$ 532,687	\$ 297,264	\$ 274,067	\$1,104,018
Percent of Total	48.25%	26.93%	24.82%	

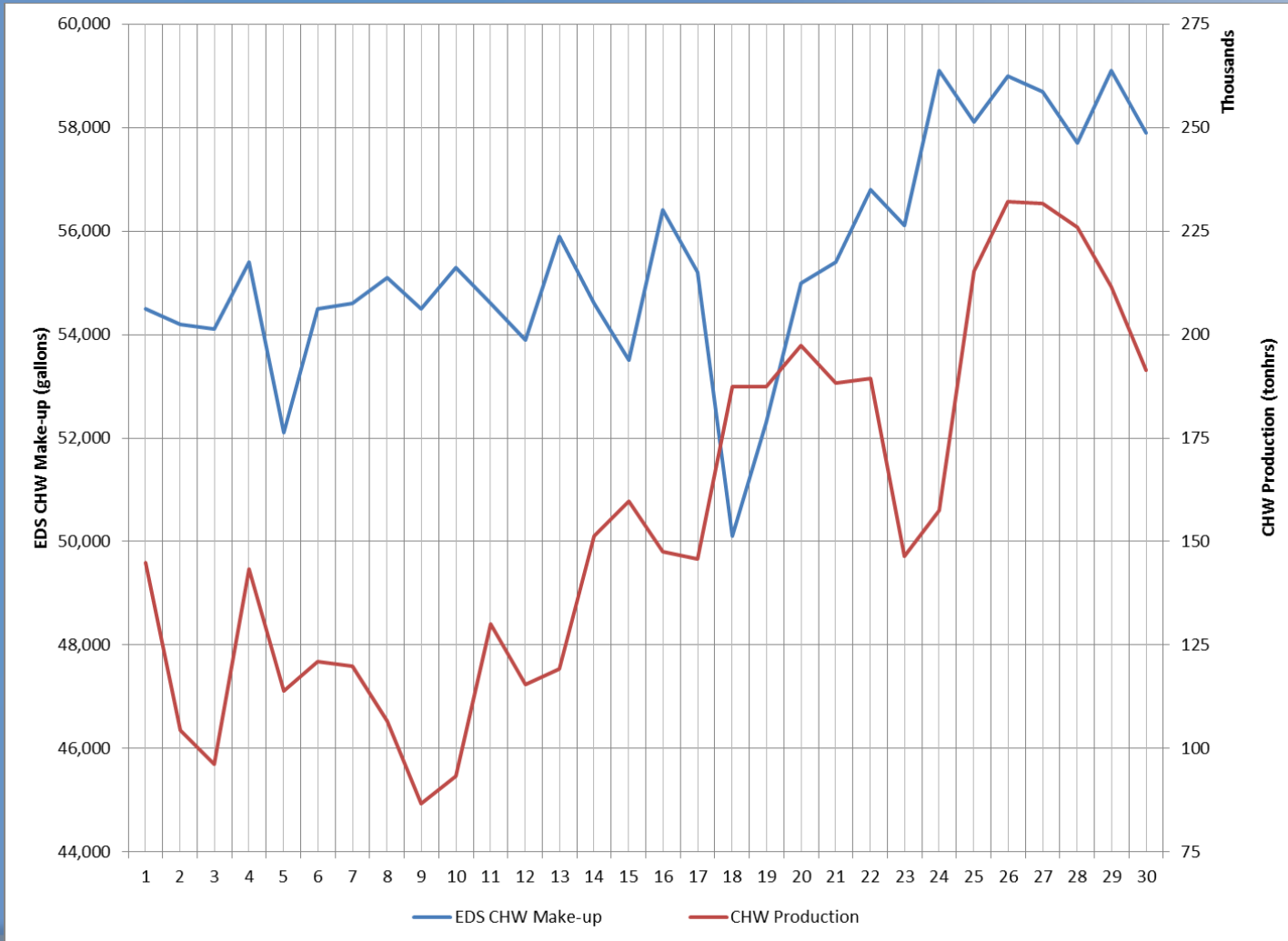
Costs shown from April 2007 through March 2016

8. *DES Projects*

- DES-104: Time of Use Billing – TOU Charges for CHW
 - New procedure begins with July 2016 invoice
- DES-110: Alternate Fuel – Offsite Storage of Propane
 - Reviewed options; selected offsite storage
- DES-111: DES CHP – Cogeneration at the DES Plant
 - Preliminary design phase; economic viability
- DES-119: CHW Delta T – Hydroflow Device
 - Testing device to assist in cleaning CHW HX's
- DES-124: CJC Redevelopment – Demo of CJC
 - Partial shutdown in August
- DES-125 and 126: CHW Leak
 - Please tell us if you know where the leak is



April 2016 EDS CHW Make-up



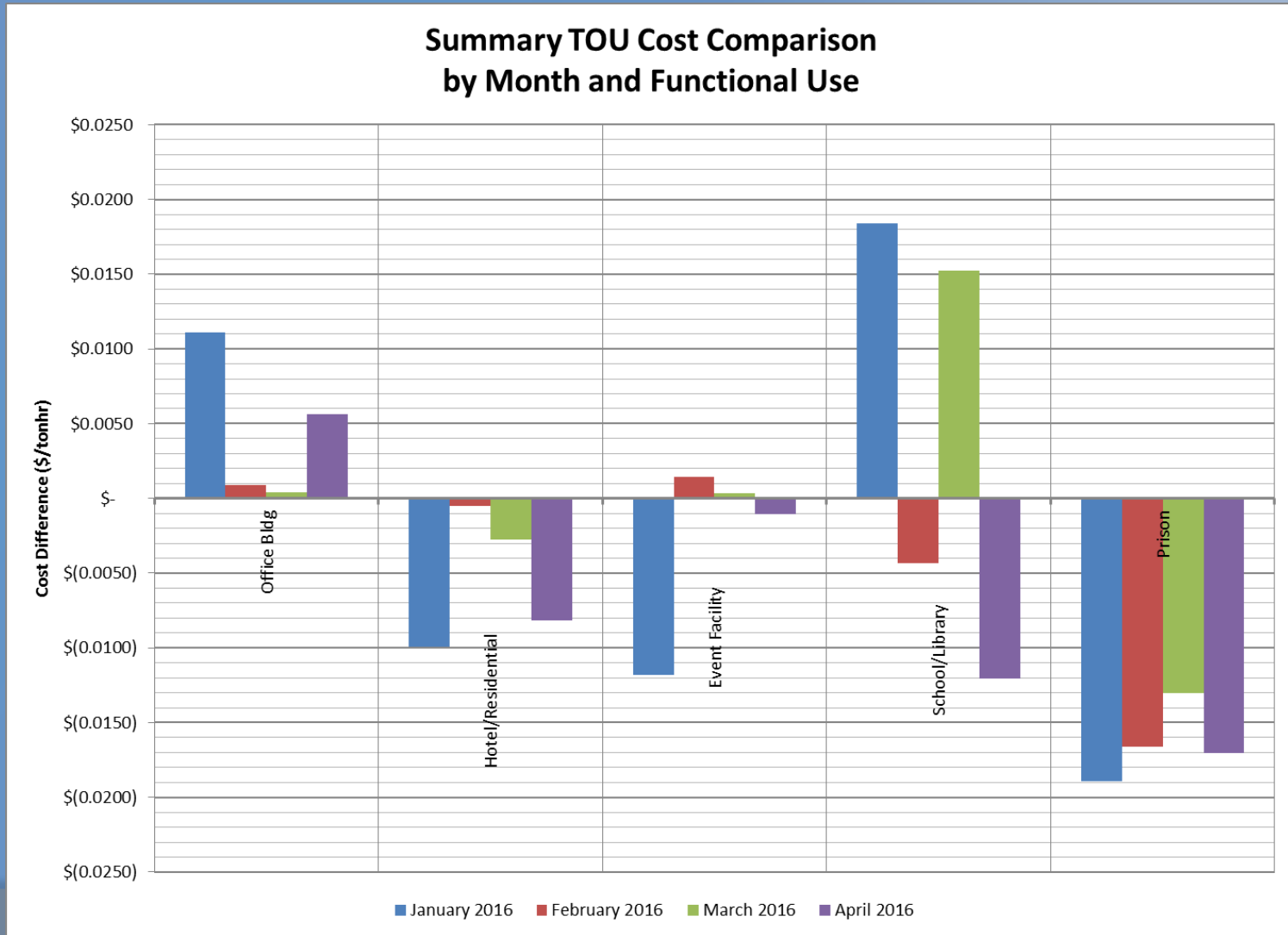
DES-104: TOU Billing

Electric Time of Use On-Peak/Off-Peak Schedule

- ❑ On-Peak Summer: Apr, May, June, July, Aug, Sept, Oct M-F 1 pm to 7pm
- ❑ On-Peak Winter: Nov, Dec, Jan, Feb, Mar M-F 4am to 10 am
- ❑ Off-Peak: All other times plus Federal Holidays and Nov 1 if it falls on a Tues, Wed, Thurs or Fri
- ❑ Anticipate Implementing TOU with July 2016 Customer Invoice

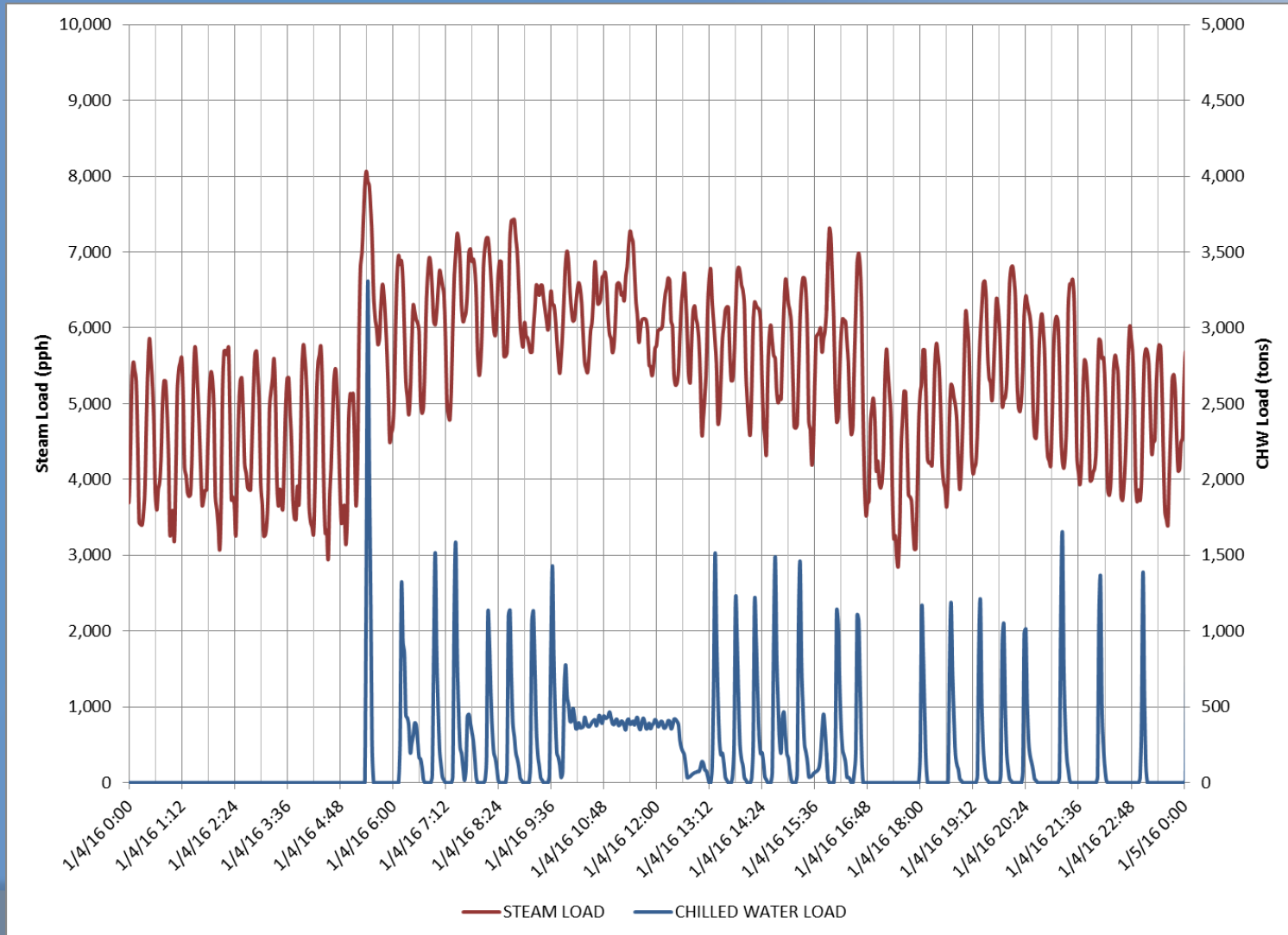


Summary TOU Cost Comparison





Sample Customer Load





9. Questions and Answers

*Partial Steam and CHW Shutdowns in
August 2016 for CJC Demo*

*Please complete and submit survey to
Harry or Kevin*

10. Adjourn