ENERGY DEPARTMENT NEWS
(FY 2017-18)

During the fiscal year there is an Energy Department News section written in the Monthly Energy Report to keep CFISD Managers up to date with what is happening in the Energy Management Department. The following is a monthly summary for the fiscal year (2017-18).

JULY 2017

LED RETROFIT WAREHOUSE

Using the energy-rebate funds, Carey/Shawn and their team are going to retrofit the fixtures to LED at the Distribution Warehouse (Windfern Annex). This will likely be completed in December. The costs and savings were calculated and are very good! Here are the financials:

Figure 1: Financials for installing LEDs (Distribution Warehouse)

Install Costs	$ (42,796.33)
Yr 1	$ 21,943
Yr 2	$ 21,943
Yr 3	$ 21,943
Yr 4	$ 21,943
Yr 5	$ 21,943
Yr 6	$ 21,943
Yr 7	$ 21,943
Yr 8	$ 21,943
Yr 9	$ 21,943
Yr 10	$ 21,943
Yr 11	$ 21,943
Yr 12	$ 21,943
Yr 13	$ 21,943
Yr 14	$ 21,943
Yr 15	$ 21,943
Yr 16	$ 21,943
Yr 17	$ 21,943
Yr 18	$ 21,943
Yr 19	$ 21,943
Yr 20	$ 21,943
Total Net PV	$ 275,394
IRR	51%

Savings	$ 21,942.74	Per year
Material	$ 61,307.00	Install
Labor		Install
Useful Life	20	Years
CIEAResult Incentive	$ 18,510.67	Initial

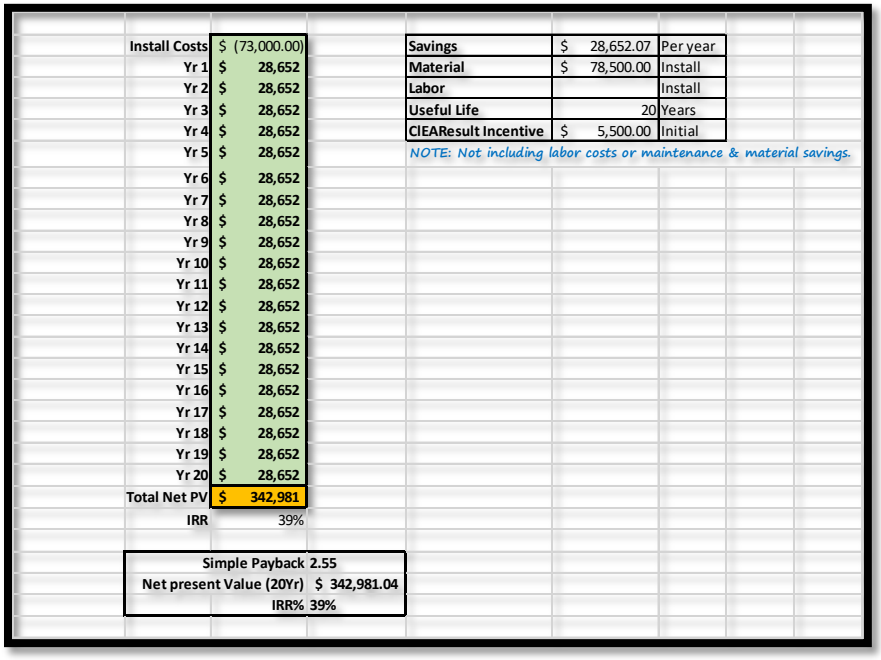
NOTE: Not including labor costs or maintenance & material savings.

Simple Payback	1.95
Net present Value (20Yr)	$ 275,394.34
IRR%	51%

CREE RETROFIT OP & MAINTENANCE BUILDING

A CREE representative did a walk-thru in the Maintenance & Operation Building to investigate the feasibility of putting in CREE LED fixtures and lighting controls; the lighting controls will consist of occupancy, daylight, and dimming and will meet current IECC 2015 standards. After totaling the number of fixtures and lighting control switches, the costs and savings were calculated, and the results were very good! Carey took a look at it and suggested that we put a sample in my office first (a sample is being ordered). If we use the CREE fixtures, we don't have to run 0-10V to all of the fixtures for dimming control - instead we can use the regular line voltage for dimming ("Smart casted" over wireless mesh network); so the installation will be merely replacing the existing wall switches and fixtures and setting up the controls (a one-time set-up). The fixtures and switches are easy to configure with the CREE remote configuration tool. One downside, Carey noticed that a neutral is needed for the control switches (which are actually transmitting and receiving); so a neutral will have to be located and run from the nearest junction box (making the install just a little more complex). Here are the financials (see figure below):

Figure 2: Financials for installing CREE LEDs & Controls (Op & Maint. Building)



Install Costs	$ (73,000.00)
Yr 1	$ 28,652
Yr 2	$ 28,652
Yr 3	$ 28,652
Yr 4	$ 28,652
Yr 5	$ 28,652
Yr 6	$ 28,652
Yr 7	$ 28,652
Yr 8	$ 28,652
Yr 9	$ 28,652
Yr 10	$ 28,652
Yr 11	$ 28,652
Yr 12	$ 28,652
Yr 13	$ 28,652
Yr 14	$ 28,652
Yr 15	$ 28,652
Yr 16	$ 28,652
Yr 17	$ 28,652
Yr 18	$ 28,652
Yr 19	$ 28,652
Yr 20	$ 28,652
Total Net PV	$ 342,981
IRR	39%

Savings	$ 28,652.07	Per year
Material	$ 78,500.00	Install
Labor		Install
Useful Life	20	Years
CleaResult Incentive	$ 5,500.00	Initial

NOTE: Not including labor costs or maintenance & material savings.

Simple Payback	2.55
Net present Value (20Yr)	$ 342,981.04
IRR%	39%

DEMAND RESPONSE

There are three companies looking at doing Demand Response with CFISD (with management permission of course. We can start as small as we want, for a pilot (We are set up with a ALC program in Bleyl MS and Jersey Village HS). EnerNOC would set everything up for us – we don't have to provide the technical expertise. There are not many load shedding ERCOT "events" – I think the last one was three years ago, but we

do have to have a thirty-minute test, every once in a while, to see where we are at. The only thing for generators to be approved, is that they have to be EPA approved. They will want to see our "Stack test" which indicates the amount of (O2, NOx and CO is in the flue).

There is no financial responsibility from CFISD; if we can't perform, we'll just be kicked out of the program. I'm really impressed with the data collection software that we'll end up getting for free (for signing up). There is a cost for them to set that up, and therefore, they may be only interested in our larger accounts (like middle and high schools); these would be our IDR meters. The smaller schools (i.e. elementary) they might not be interested in. They get paid by splitting the ERCOT payment, ($55,000 per MW in 2017). I'm thinking we could get 500 kW per High School and around 250 kW per Middle School (so around $300K a year for CFISD).

BUILDING OPTIMIZATION TECHNOLOGIES (RMS SOFTWARE)

We are also considering real-time monitoring software that takes advantage of the Smart-Meter of Texas website. The software is called "RMS". This is software that takes the Texas Smart Meter data and makes it easy to use (the actual on-line Texas Smart Meter website is not very good and hard to use). This makes it easy and quick to analyze if a building is being overridden and/or if something is out a whack (we don't have to wait until the bill comes in two months later). They also make these nifty "heat maps" that allows you to quickly see if your building is being overridden (see below). The blue indicates when the building is off: the rows are hours, and the columns are days.

Figure 3: RMS Software Heat Maps

After the hurricane, we had a lot of schools still on override that we didn't know about (we're lucky David Tooker alerted us to it); then we quickly fixed it. The RMS software

would have alarmed us in the future if this occurred. The Texas Smart Meter data (and this RMS program) is non-invasive (it's just our electric meter data) – nothing else.

https://www.bldgot.com/rms-videos

AUGUST 2017

LED RETRORFIT WAREHOUSE (Update)

Using the energy-rebate funds, Carey/Shawn and their team are going to retrofit the fixtures to LED at the Distribution Warehouse (Windfern Annex). Two out of the three warehouses are finished; the rest will be finished in January. This is paid for out of the rebate fund and will likely be a pretty large incentive from Center-Point because of the large number of fixtures and the 70% reduction in power use.

CREE RETROFIT MAINTENANCE BUILDING (Update)

A CREE representative did a walk-thru in the Maintenance & Operation Building to investigate the feasibility of putting in CREE LED fixtures and lighting controls; the lighting controls will consist of occupancy, daylight, and dimming and will meet current IECC 2015 standards. A demo was installed in Jay's office. The color temperature is 4000° K which is the district standard; I have received a few negative reviews because it appears to be a little "yellow". We can make the rest of the fixtures in the building 5000°K (which is what it is now – cool white). Another issue is that one of the two fixtures also needs to have an emergency switch on it. Per Shawn or Carey: we'll have to add switch to the costs (and total up the number of fixtures with emergency switches in the building). We are in the process of working on adding those in.

ENERNOC DEMAND RESPONSE (Update)

There are three companies looking at doing Demand Response with CFISD. Some of the companies have very good real-time energy software; the other companies may have a little better split on the ERCOT payout.

SEPTEMBER 2017

CENTERPOINT/SCORE CHECK

We received another CenterPoint SCORE check for $62,446.40 due to implementing more energy conservation retrofits (from both the 2014 Bond and our own initiatives); the total incentive check for 2017 thus far is $202,531.94!

These funds will be used to implement more energy conservation measures in 2018. We also got a large bill from SchoolDude for the automation ($28,740 one-time FSA set-up, and $20,061 annual SchoolDude FSA fee); we'll pay this SchoolDude FSA bill out of the rebate account.

HOLMSLEY ELEMENTARY SCHOOL GRAB WASTE UPDATE

A member from the MUD #264 board has been alerting CFISD regarding grab-waste fees at Holmsley Elementary School. These fees are charged by Severn Trent if they feel like we are returning harmful chemicals and particles into the sewer, which they have to spend money cleaning up at the sewer plant. Last January, the fees were high; we tried cleaning out all three grease traps behind the kitchen and it seemed to help (there was a small one that hadn't been cleaned). But in the month of October the fees were high again - $1,093.00 (see below), mostly because of the Suspended Solids. Carey and Bill Smith changed out the flush valves under Jay's directive (from 1.28 gal/flush to 3.5 gal/flush); the higher gallons per flush will dilute sewer drain more. In the November test the Suspended Solids went down, but the BOD was high (still we saved over $500 in fees). The grease traps will be cleaned again before the next test; hopefully this will affect the BOD test favorably.

Bill Smith thinks that the short conduit run is part of the reason we have problems only at this school. We visited other elementary schools which pass their grab waste test every month, and they all had long sewer pipe runs to the manhole (where the test is taken).

Unfortunately, after doing a simple mathematical calculation, it was found that the extra water used with the new flush valves will be about equal or exceed the actual penalty we are receiving from Severn Trent. This knowledge will be useful going forward, when dealing with concerned citizens.

October 2017 Grab waste Test Holmsley ES

Holmsley Elementary Account #264001900	Amount	Surcharge Ceiling, mg/l	Surcharge
Water usage, gal	240,000	N/A	N/A
NH3-N, mg/L	28.3	25	$19.16
BOD, mg/L	168	200	$0.00
TSS, mg/L	669	200	$1,032.63
Lab fee		N/A	$42.00
Total Surcharge			$1,093.78

November 2017 Grab waste Test Holmsley ES

$1.10 per pound of excess TSS, and $2.90 per pound of excess NH_3-N. Surcharges for the month are listed as follows:

Holmsley Elementary Account #264001900	Amount	Surcharge Ceiling, mg/l	Surcharge
Water usage, gal	173,000	N/A	N/A
NH3-N, mg/L	5.53	25	$0.00
BOD, mg/L	582	200	$440.93
TSS, mg/L	252	200	$82.53
Lab fee		N/A	$42.00
Total Surcharge			$565.46

This surcharge amount is included in your monthly water bill in addition to your regular water and sewage charge. If you have any questions, please call our Customer Service Department at 281-579-4500.

Sincerely,

DEMAND RESPONSE

After talking to management, we may be signing up for a Demand Response for this winter season. There are two programs: the CenterPoint Standard Offer Program (SOP) and the ERCOT Emergency Reponses Program (ERS). The pilot is likely to include the following for each program (see chart below). A one-year agreement is set to begin in January. An agreement will be drawn up shortly for the pilot (there will be two agreements); it is likely to bring in $100K annually (if we stay with it). Our hope is that it'll be successful and be expanded! One of the side-benefits is that they will install data collection meters to give us real time kW/kWh usage of our facilities (only those that are signed up); this real time metering will allow us to find problems faster – saving the District a lot of money! I attached a document to this report that goes over both programs again. When we get back from break, we can schedule a meeting with the Directors to make sure they're in the loop. The sign-up period is the 2nd week in January.

OCTOBER 2017

DEMAND RESPONSE (Update)

CFISD officially signed up for a pilot Demand Response contract (see the facility list below). We removed ISC from the list, since there did not seem to be a lot of load on

either of the generators, and we didn't want to risk a momentary loss in power (because of a transfer switch) during a board meeting. Keep in mind, in case anyone has second thoughts, we can always bid zero kW on any of these buildings (and exclude them from the DR "event"). However, bidding to zero kW, means that we'll not receive any payment for those facilities. The bids are due at the beginning of three 4-month seasons: Spring (Feb), Summer (May), and Winter (Oct). With this small list, we should receive approximately $50,000 per year – it's just a start for our District (our goal is to receive an annual check of several hundred thousand dollars, annually)!

- Demand Response HVAC: Some work is being done by ALC, so that we'll just have to press a button during a test or event for their schools. At the press of the button, the OA dampers will close, and the temperature will be set-back 4 degrees. Remember that the test is only 30 min; it may be that by the time the teachers notice, everything should be back to normal again.
- Demand Response Emergency Generators: A piece of hardware will be installed to automatically activate the transfer switch and start up the generator sequence. We'll have to install IP drops and 120V power to these devices. This program (CenterPoint SOP Program) doesn't start until June, so we have some time to install the hardware and utilities.

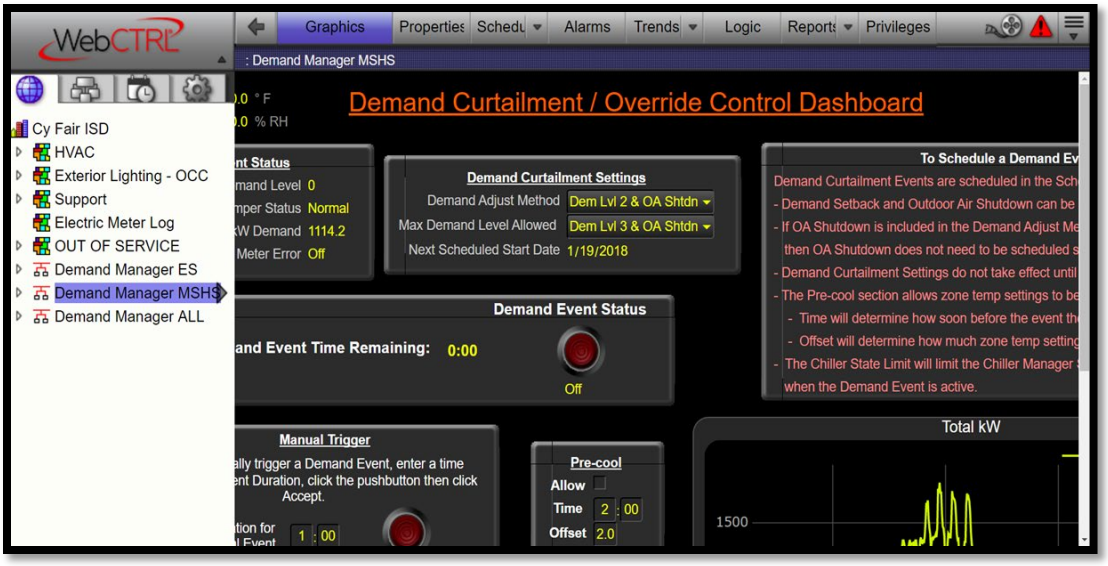
Demand Response Pilot Facilities

School	Load	Program
Bleyl MS	HVAC	ERS
JVHS	HVAC	ERS
Bleyl MS	Emergency Gen	SOP
Berry Center	Emergency Gen	SOP
Food Processing	Emergency Gen	SOP
New Cold Storage Facility	Emergency Gen	SOP

DEMAND RESPONSE (Update)

CFISD had its first Demand Response test on February 8, 2018. The Energy Management Department had previously contracted David Murrah of Automated Logic to set up a "one-button" operation on the ALC Dashboard. The call for the test came at 2:00 pm. We were able to resume normal operation at 2:50 PM. Only Bleyl and JVHS were cut back because they are the only schools on the pilot program. We plan on setting up many more schools this year. With these two school alone, we should be able to receive approximately $25,000 a year (if we passed the test). Whatever we were not able to cut will simply cut into our payment from ERCOT. Therefore, if we could only cut 80%, we'll receive 80% of our bid. We won't know until 45 days. If we don't pass the test, we can retake it two more times.

After monitoring the test ourselves (on our own kW metering), it was noted that that we did well initially, but then our kW started increasing again before the event was over. I noticed that the secondary pumps were ramping up to 60 Hz. The reason for this may have been that since the Admin areas are excluded from this, that the chilled water valves kept opening as the chilled water temperature was deceasing (to satisfy the load). This wide valve position likely caused the DP to be reset to a higher psi (this would make the big secondary pump motors ramp up – increasing kW). Jay will be working with ALC on getting this fixed (require more cooling requests first instead of just one). We plan on getting 20 more elementary schools signed up this spring. Combined, the 20 elementary schools will also make approximately $25,000 a year savings (bringing our total up to $50,000). On top of this, we plan on signing up our emergency generators at the Berry Center, Food Production and Bleyl for another $50.000 payment – making our total $100,000 annually. Expanding the program out to the rest of the District should bring around $400,000 in annual revenue. This will be a more strenuous test but will not involve air conditioning or lighting (except some emergency lighting); most of the load will be freezers that will be running off the generator. We can also use the same program to reduce our load during 4CP in the four summer months – which will ultimately increase are demand savings for the year (charged by CenterPoint).



INTEGRATION UPDATE

The District is about 85% integrated to SchoolDude. The Coordinators have done a great job finishing up this task. Jay has many tasks to delegate to the Energy Coordinators, such as helping him with SCORE program (doing pre/post inspections, obtaining submittals, drawings and certifications for CLEAResult). During the pre and post inspections, entire buildings must be walked, so everyone will have to get their badges ready and their walking shoes on!

BOND RENOVATIONS UTILITY COSTS

At the request of the contractors and project managers, many of the facilities were running 24/7 during the bond renovations in November. The extra costs of these run-times is shown in the table below. In January, most of these facilities were put on some type of schedule, even though some of them are still not completed.

Bond Renovation Utility Costs

BUILDING	Extra Costs
CY-SPRINGS HS	$10,528
DEAN MS	$6,851
MOORE ES	$2,949
ADAM ES	$44
BANE ES	$837
WILLBERN ES	$204
Extra Costs due to Const in Nov	**$21,412**

UTILITY BILL AUDITING

Sonia tabulated the money that she cost-avoided during 2017 (see Table below). Jay used to hand deliver the potentially late bills, but since the Energy Coordinators have the travel stipends, they are now hand delivering them to avoid late payment. Sonia's auditing saved a total of $312,982.92 to the District in 2017!

Bridgeland HS high water bills from Sept. thru Nov. totaling $164,594 was reinvestigated and later credited back. Thanks to Sonia, Shannon, David T. and Carey for checking the blow-down, reading and rereading the water meters, talking to the Severn Trent engineers and getting them to agree we didn't fill 18 Olympic-sized swimming pools like the new Natatorium (which was exactly the equivalent)! Also, Shannon Thompson had pictures of them flushing their water lines right down the storm sewer. As a result, they wiped the charges off the books thanks to everybody's diligence and hard work!

Utility Savings by Month 2017	Electric	Gas	Water	Yearly Total
Jan			$ 30,664.68	
Feb	$ 285.78	$ 357.22	$ 1,075.94	
Mar	$ 85.91		$ 7,262.21	
Apr	$ 3,171.32	$ 2.62	$ 2,698.88	
May	$ 378.49		$ 2,089.16	
Jun	$ 416.91	$ 1.33	$ 14,174.83	
July			$ 6,742.33	
Aug			$ 24.00	
Sep			$ 30,622.49	
Oct			$ 27,244.85	
Nov			$ 177,803.12	
Dec			$ 7,880.85	
TOTALS	$ 4,338.41	$ 361.17	$ 308,283.34	$ 312,982.92

DECEMBER 2017

BEHAVIOR MODIFICATION/CAMPUS ENERGY EDUCATION PROGRAM

The Champion Information Packet will be ready for committee members to approve it on the March 29th meeting, for the selection of elementary school's Energy Champions. Curriculums, site audits, video educational materials, etc. are being worked on as well as ideas on how to best utilize the new kiosks in every school. Roy will introduce the program at the DLT in April. Roy suggested to have the Champion Information Packet ready to send to the principals in April, so they can determine who the Energy Champion would be possibly before end of this school year. It will include the Stipend Form.

INTEGRATION UPDATE

The District is about 95% integrated to SchoolDude. The Coordinators continue to do a great job on this task.

BOND RENOVATIONS UTILITY COSTS

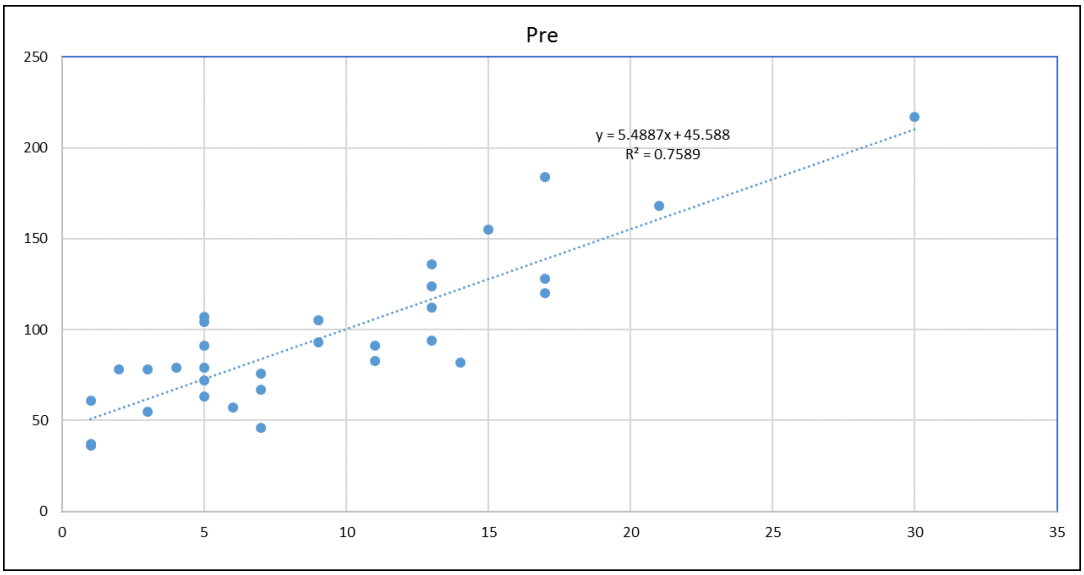
At the request of the contractors and project managers, many of the facilities were running 24/7 during the bond renovations in December. The extra costs of these run-times are shown in the table below. In January, most of these facilities were put on some type of schedule, even though some of them are still not completed.

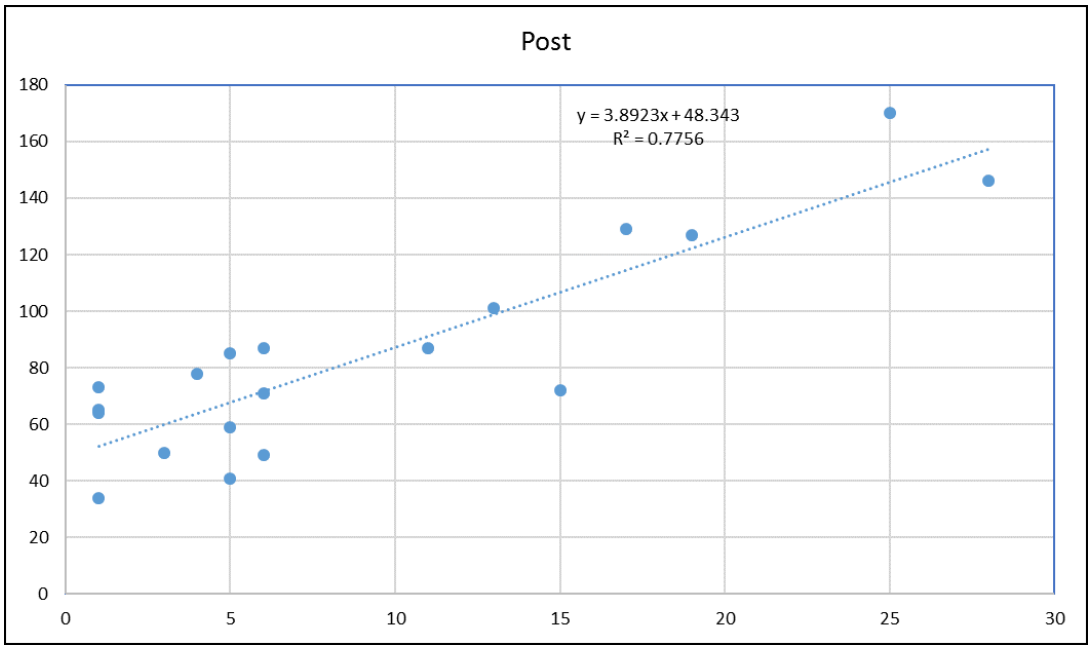
Bond Renovation Utility Costs

BUILDING	Extra Costs
CY-SPRINGS HS	$8,525
DEAN MS	$3,609
MOORE ES	$292
ADAM ES	$578
BANE ES	$903
WILLBERN ES	-$362
Extra Costs due to Const in Nov	**$13,545**

M2G GAS CONTROLLERS

M2G gas controllers (installed in early December at Bleyl MS, Cy-Lakes HS, Cy-Woods HS, and Spillane MS were evaluated; the natural gas savings were better than expected (29% - see below). CLEAResult also verified the savings. Based on these savings, financial evaluations were calculated for the schools where the controllers were installed (see below). The NPV was calculated to be $203,000 and the IRR was calculated to be 61%.





	Cy -Lakes	Cy -Woods	Blyel	KAHLA MS	Spillane	Total
Jul	169	90	23	230	15	527
Aug	254	51	31	280	1	617
Sep	312	113	50	420	72	967
Oct	336	201	168	1620	200	2,525
Nov	400	295	219	3100	307	4,321
Dec	725	751	539	4680	633	7,328
Jan	937	833	674	6670	772	9,886
Feb	748	1141	576	6410	877	9,752
Mar	296	636	331	2900	580	4,743
Apr	188	445	195	2930	390	4,148
May	122	258	124	2350	233	3,087
Jun	32	72	30	690	90	914
Total Usage	**45190**	**48860**	**29600**	**32280**	**37530**	**193,460**
Nat Gas Rate	0.541	0.541	0.541	0.541	0.541	
$ Nat Gas Costs	$ 24,447.79	$ 26,433.26	$ 16,013.60	$ 17,463.48	$ 20,303.73	
Savings%	0.291	0.291	0.291	0.291	0.291	
Install Costs	$ (14,256.00)	$ (14,256.00)	$ (7,128.00)	$ (7,128.00)	$ (7,128.00)	$ (49,896)
Yr 1	$ 7,114.31	$ 7,692.08	$ 4,659.96	$ 5,081.87	$ 5,908.39	$ 30,457
Yr 2	$ 7,114.31	$ 7,692.08	$ 4,659.96	$ 5,081.87	$ 5,908.39	$ 30,457
Yr 3	$ 7,114.31	$ 7,692.08	$ 4,659.96	$ 5,081.87	$ 5,908.39	$ 30,457
Yr 4	$ 7,114.31	$ 7,692.08	$ 4,659.96	$ 5,081.87	$ 5,908.39	$ 30,457
Yr 5	$ 7,114.31	$ 7,692.08	$ 4,659.96	$ 5,081.87	$ 5,908.39	$ 30,457
Yr 6	$ 7,114.31	$ 7,692.08	$ 4,659.96	$ 5,081.87	$ 5,908.39	$ 30,457
Yr 7	$ 7,114.31	$ 7,692.08	$ 4,659.96	$ 5,081.87	$ 5,908.39	$ 30,457
Yr 8	$ 7,114.31	$ 7,692.08	$ 4,659.96	$ 5,081.87	$ 5,908.39	$ 30,457
Yr 9	$ 7,114.31	$ 7,692.08	$ 4,659.96	$ 5,081.87	$ 5,908.39	$ 30,457
Yr 10	$ 7,114.31	$ 7,692.08	$ 4,659.96	$ 5,081.87	$ 5,908.39	$ 30,457
Total Net PV	$45,078.14	$49,863.10	$31,672.22	$35,166.41	$42,011.38	$ 203,791
# of Boilers	2	2	1	1	1	7
IRR	41%	46%	59%	66%	78%	61%

Simple Payback	1.64
Net present Value (10 Yr.)	$203,791.25
IRR%	61%

ELECTRIC PRICING/EXTENSION LOCK-IN

Roy Jay and Sonia worked on a contract with TXU in locking electric pricing for the years 2021-2023; the rate for that time period will be $.03877 per kWh. Because of the retirement of coal plants, the short-term prices for electricity have jumped up to 4.5 cents per kWh for some customers. Therefore, we thought it was a good time to lock in still pretty good prices for that future time period, 2021- 23; (it's still more than 20% less than we are paying right now, and will be less than the May 1, 2018 contract price of ($.0395). The contract will save the District $442,000.00 during that 2021-23 time period.

Contract Term	Current $/kWh	Estimated Usage (kWh)	Current Costs	Start Date	End Date	
2	0.039500	400,000,000	$15,800,000	5/1/2021	4/30/2023	
			10% Renw			
Retail Electric Provider (REP)	Bandwidth	Rebate	Hub Zone Price / Per kWh (10% Renw)	Cost HZ (10% Renw)	Savings HZ (10% Renw)	Notes
TXU	20%	$ 150,000.00	0.038770	$15,508,000	$ 442,000	*$75,000 Rebate per year added in*

CEEP UPDATE

We will divide the elementary schools into 4 groups of 14. Regarding the incentive of $1,200 if they reach their target savings reduction of 5% - all principals were "okay" with it. If we are not offering the additional awards, the principals stated this amount by itself was not all that attractive. Incentives be allocated to their Activity Fund; funds in this account will be carried over, year after year and they are not required to use the funds by a specific date. For the Awards – Most Improved School - $2,500 and Most Efficient School - $2,500 – the amounts are good with all principals and they liked the fact that one school could in fact win both awards. Then, for the 2 "Major Awards" – "Most Improved School Overall" and "Most Efficient School Overall" – the amount of $5,000 per award was very attractive to the principals. The Stipends Incentives and Awards will be as follows:

- Energy Champion Stipends: $1,000 each.
- Annual Incentives (if they achieve 5.0% savings): $1,200 paid to each School's Activity Fund.
- Group Awards (two per group for a total of eight): $2,500 paid to Activity Fund.
- Major Awards (two for all 56 ES): $5,000 paid to Activity Fund.

The packet will be sent out for printing to ensure it will be ready for the May DLT Meeting. Jay is preparing a PowerPoint presentation for the May DLT. The CEEP Coordinator has an "Introductory Email to Principals" ready, with dates changed to reflect this being announced in May. She would like to send this to Principals this month (April) once approved by Roy. This will give the Principals a little more time to liaise with their staff and determine who the Champion would be. An Energy Champion Job Description will be sent at the same time. Training was given to a Cy-Fair Instructional Technology Coordinator. She is now set up to host webinar meetings, create video clips and send video clips.
The CEEP Coordinator is meeting with Project Managers, Technology Staff and Unify, to ensure the Energy Kiosks are fully functioning before the end of the school year. Once they are all complete, she will attend training with Unify on how to access them remotely and how to upload information to them.

FEBRUARY 2018

NATURAL GAS TRANSPORT RATE

CenterPoint identified four more meters that could be transferred to a Transport rate; the transport rate is sort of like a "Transmission" rate. Roy signed the paperwork; it'll save approximately 25%, which comes to $23,353.00 annually.

Amount		
Year	Building Desc	TOTAL
2018	BLEYL MS	$ 22,381
	CY-FALLS HS	$ 17,353
	LANGHAM CREEK HS	$ 25,254
	MATZKE MILLS ES	$ 28,424
(2018) Total		$ 93,413
Grand Total		25%
	Rate Savings	$23,353.21

SUMMER OUTDOOR AIR SHUTDOWN

The energy managers and coordinators spent a day working with ALC in closing the outdoor air dampers this summer for buildings that were unoccupied but were still under the dehumid schedule. Five high schools, five middle schools and a few elementary schools were set up to close the OADs (we had already set up most of the elementary schools that had the OAD program last summer – around 20). The schedule will have them automatically put back to normal when school is back in session. This exercise will save the District approximately $50,000 this summer. Also, it's now linked so it'll work automatically from now on (all we have to do is put the schedule in for future years). The old schools with the old controllers were left alone, because they were not easily set up for complexities of matching the exhaust fans with the OA dampers and OA _AHUs. I really appreciated everyone's help, knowing they were already busy with the summer shutdown!

TXU REDUCTION REWARDS CHECK

TXU brought the Reduction Rewards check on Wednesday, June 13th. A picture of the big check ($15,000) with Cindy and the TXU representative will be posted on Twitter. Cindy did most of the scheduling for the event last winter (she was the only one working with Jay to shut down the portables).

ISC LIGHTING PROJECT

The ISC LED lighting project went for Board approval on June 14th. This project will produce very good energy savings by retrofitting the existing T12 lamp fixtures, to CREE LED fixtures for both the interior and exterior of the Instructional Support Center (ISC Building). This project will save approximately 1,447,239 kWhs per year, $124,205 per year. In addition, there will be a rebate awarded from CenterPoint SCORE of approximately $30,000. The twenty-year net present value is $1.4 million (the fixture life should be longer than that). Karen Smith and Mellissa Mcanear let the Energy Department keep part of the surplus ($187.5K) to help pay for the project which will cost $363K. Carey and Shawn's teams will be working on this project this coming year. A large sum was allocated for overtime labor ($30,000); more funds will be available if needed.

SAVINGS CALCULATION			
5,200	*Base kWh/day Load (Avg.)*		
79%	*% Lighting*		
4,108	*Interior/Exterior Lighting kWh per Day (Avg.)*		
365	*Days/Year*		
1,499,381	*kWh Yr Lighting*		
79%	*Reduction (Going from a T12 to an LED fixture) plus ctrls*		
1,186,261	*Lighting kWh Savings*		
260,978	*A/C Savings (22%)*		
1,447,239	*kWh Yr Savings (Added 22% for A/C Savings)*		
$0.075	*New Electric Rate*		
$108,108.75	*Annual Electric Savings*		
$16,096.88	*Annual Maintenance Savings*		
$124,205.62	*Total Annual Savings*		

Costs	
Material (Int)	$296,451.00
Material (Ext)	$36,488.00
Labor (Est.)	$30,000.00
TOTAL	**$362,939.00**

Financials	
$363,029.00	**Cost**
$124,205.62	**Savings**
Ten Yr NPV	**$676,185**
Twenty Yr NPV	**$1,441,589**
IRR (10)	32%
2.9	Yr. payback

CENTERPOINT RECOMMISSIONING

We received three reports back from ESA regarding the CenterPoint Recommissioning Program (for Langham Creek HS, Campbell MS, and Rennell ES). The reports are very detailed regarding the types of mechanical systems that are at these buildings; along with many low-cost energy conservation measures to implement. There are also capital improvement measures such as converting some of the large rooms from constant volume to variable volume (this works well, and we used it a lot at Johnson Controls). In addition, indoor air quality measures were also found; these have been forward to David Tooker to implement right away.

One example was that the OA air handler unit's cold and hot coils were locked out because it had no OA fan status (however, this particular OA unit did not even have a fan!); so the program will have to be altered so the AHU fan status (not the OA AHU) will show ON instead. We will meet with CenterPoint later this month to go over the implementation of these ECMs. We are required to make $30,000 in repairs, which should be easily doable with their long list; this is a requirement if we want to participate in this program. We'll likely have to hire someone from the outside to help us implement everything since David's crews are maxed out.

Another good reason to do recommissioning (along with saving energy and IAQ) is that it's exactly what Cenergistics was trying to do in our District, except with the CenterPoint program, we get to keep 100% of the savings. Also, Cenergistics would use ex-teachers – not professional engineers to do the studies. They would also likely charge for anything they found, regardless if it was implemented or not.

We are presently working on three more schools (Cy-Ranch, Smith MS and Warner ES), doing walkthroughs and obtaining the necessary drawings and submittals. After that, we plan on doing Cy-Ridge, Cy-Springs and Cy-Fair HS's.

Here is a link on the S:Drive to the reports: S:\FACVOL\Support\ENERGY MANAGEMENT\Centerpoint_Retro_Comissioning

ENERGY WATCHDOG

Sonia is in the middle of switching 6 years of utility bill data over to a new online utility bill management system: Energy Watchdog. It's a big undertaking, but I believe we'll have a system that's more versatile and functional in the end. All the buildings, accounts and actual bills have to be transferred over to the new system! There will be an Import feature that will allow us to transfer our electric (and maybe gas) bills in quickly; we should be more up to date with our District utility data. My goal is to have these Monthly Reports to you a few weeks earlier. I'm also planning on making some dashboards that will make the data easier and interactive for executives to evaluate and make decisions. Thank you, Sonia, for all your diligent work in getting everything transferred over!

SUMMER TO-DO LIST

The Energy Coordinators are utilizing any extra time between scheduling requests from operations dept. to work on a To-Do list. Within this list, is to reprogram all the thermostats in the portables so they will have optimal start along with other programming changes. We physically have to go to each thermostat and change all the dip switch settings. Yvonne counted the # of portables – we have 263 portables/526 thermostats. These changes should result in considerable energy savings.

CEEP PROGRAM

Coordinators are resetting the optimal start on all the elementary schools, so they reach set-point temperature at the time that is requested. (too many were coming on too early). They are working closely with ALC and Unify to help make these changes.
Also, I requested that we add one school to CEEP on an experimental basis (Dean Middle School). One reason is that Dean doesn't have any lighting control (except for the new addition), and the school is performing badly (energy-wise). I also thought it would be good to have one of the secondary schools on the program this year, to help the CEEP Coordinator to prepare for all secondary schools that will be on the program next year. Their curriculum and activities will be quite different than the elementary schools. We'll pay for the $2,000 stipend and the energy incentive if they make the 5% savings goal, but they won't be eligible for an award.

SCORE PROGRAM

We are gathering up all the necessary submittals and drawings along with doing pre inspections to qualify for CenterPoint SCORE incentives; everybody is assisting me: PMs, PCs, ECs! Our goal is to reach over $250K in incentives. I'm also doing an M&V (Measurement and Verification) at one school, Holmsley; doing M&V instead of counting on a deemed saving calculator will bring in around 40% more in incentives (the utility gives a higher incentive rate plus we'll capture actual savings which are higher than their calculator). I'm requesting that CLEAResult allow us to do others bond projects with M&V as well (and also increase our incentives 40% on those projects) - there are several good candidates in the bond program. We bought the Metrix 4 software program that is utilized for this measurement. It makes sense to do M&V when the total bill is expected to drop more than 10%. A good candidate would be one that is retrofitting both the lights (to LEDs) as well as retrofitting the WC chillers. Here is Holmsley M&V Plan on the S: Drive \\cfisd.loc\dfs_shares\district_shares\FACVOL\Support\ENERGY MANAGEMENT\M&V_Plans

MAY 2018

7/24/2018 | MEETING CALLED TO ORDER BY Jay Bonham

ARTICLE I. IN ATTENDANCE

Roy Sprague, Matt Morgan, David Tooker, Carey Ramsey, Tammy Blankenship, Geoffrey Morales, Colleen Gallagher, Leah Spurlock, Jay Bonham, Sonia DeSouza

ARTICLE II. DISCUSSION ITEMS:

IAQ Meeting (1/2 hour prior David/Tammy/Jay)
Cook MS: Remediated; mold was in the musical instruments-ok now
Holbrook: patchy mold in carpets in Rms. 610-619 / AHU8 Area D- solution in progress
Campbell: Sci wing mold in cabinets / was pump#1 issue, had no reheat; Dave fixed it – ok now.
Langham: Sci wing mold in ceiling tiles & possibly carpets / A new boiler was dropped & damaged during delivery. (To be replaced in approx. 2 mos) - solution in progress
CyCreek: Auditorium mold – ok now.
CyFair: Auditorium mold due to flooding from pipe leak in the roof – ok now.
Truitt: same as Cook
Thornton: possible mold in carpet, renovation cleanup; chiller down since school was out -no air yet.
- solution in progress

Establishing Standard IAQ Protocols
Roy asked for Operation and Energy Management to get the flooring, carpet etc. standards up to date and right. (He is wanting collective input not just from Facilities). These guidelines to include long term maintenance requirements and Mold Remediation. Operations Group to share their requirements with Jay for AC coverage.

Wattstopper failures
H-links are failing and Wattstopper's new H-links (v2) don't work. However, Wattstopper is repairing the old H-links, so we are limping along. W/O Wattstopper, we need to be ready for electric bills that are 15-20% higher. Therefore, planning needs to happen to be ready for the next Bond issue and new lighting controls (in addition to retrofitting T8 with LED fixtures). Carey has a 5-year plan for addressing replacing the old fixtures and controls:

5 Year Plan for Lighting Controls:
- Based on the new standards
- Replacement of new systems
- VE's take place
- Lighting Controls/LEDs
- Plan to do entire buildings not just partial

After Hours Call-Outs

- PD (Security) no longer wishes to accept the after-hours calls for AC/Light requests.
- PD only will take 911 calls, not 311
- Elevator calls will continue to be directed to Security.
- Power Outages are considered 311
- After Hour Call-Outs may be outsourced

BMOD Program – CEEP Kick Off

- Scheduled for Aug 23rd @ the Berry Center 10a-12p
- Jay asked who else should be part of the Energy Committee group:
  - Be thinking of someone you have in mind who we should include.
  - Everyone please have your recommendations by the next quarterly Energy Committee meeting.
- CEEP Coordinator is working with Technology Dept in getting the 30 Energy Kiosks setup and working.
  - Only 1 kiosk is currently working – due to a License issue.
- Jay asked if we could bring in 1 MS – Dean into the CEEP Program as a pilot.
  - Roy suggested we wait until next year when we include all secondary campuses.
- CEEP Coordinator asked if we should allow a Champion to receive the stipend if they miss turning in any monthly reports.
  - Matt stated that they should not miss any monthly reports. All agreed.
- A concern was brought up about how a campus with sensors may benefit more than a campus without sensors.
  - Jay stated that the campuses will be based on Load Factor from the previous year; but he will make an adjustment to campuses with sensors to make it fair for all campuses.

Utilities with Summer Construction Projects:

- Make plans to set an allowance for MS19 = 10% threshold (diff of 12 mos prior)
- Based on monthly/quarterly actual usage @ the Chiller Plant
- Monies from construction to go to EM

ARTICLE III. OTHER IMPORTANT SIDE-DISCUSSIONS:

Cenergistics: Roy discussed that CFISD will not be going forward with Cenergenics for their Retro Commissioning program. It is more feasible for CFISD to do our own Retro Commissioning with CP.

ISC LED Project: Roy gave EM the directive to wait until Spring on the ISC LED project. ISC may be moving to Windfern Annex.

- Jay asked if we could do a different building instead, since we have the funds.
- Carey suggested a small campus, an ES to include: Wattstopper Power Pack / OC Sensors / Manual ON / Auto OFF / Dimmers & LEDs

RMS Software:

- Takes Smart Meter Data instantly; we don't have to wait for the monthly bill
- is in all the Elem schools
- EM just signed an annual contract to extend to all the buildings
- To include 10 real time meters:
    - Solar/cellular installation

To discuss later how to handle the installations at the 10 campuses

ACTION ITEMS	RESPONSIBILITY
Create List of schools	Sonia DeSouza
Update HVAC Guidelines to accommodate Operations	Jay Bonham
Update Microbial Prevention HVAC Standards	Jay Bonham
Call Meeting to Discuss Lighting Standards	Jay Bonham
Finish Mold Remediation Procedures	Tammy Blankenship
5-year Plan For Lighting Controls	Carey Ramsey
New After-Hours Procedure	Matt Morgan
Bill Facilities for Construction Electrical Usage	Jay Bonham
Meet with Cenergistics (one more time)	Roy Sprague
Kickoff Meeting Preparation 8/22 & KO meeting 8/23	Leah Spurlock
Pick out a good candidate to replace ES lighting and controls	Carey Ramsey
Work with CenterPoint on additional Recommissioning	Jay Bonham
Holbrook WO for IAQ issue AHU 8 Area D (Rms. 610-619)	David Tooker

JUNE 2018

SUMMER SHUTDOWN

Everyone helped including: Tammy and Darin (shutting the lights OFF and closing down the kitchens) we closed off the outdoor air in unoccupied spaces as well as their usual "Holiday Out" lists. David Murrah at ALC helped set the OA portion up so it'll be a breeze

next year. Previously, David Murrah wrote a cooling tower wet-bulb program for 20 schools that helped us out as well. Our total savings for the summer were $237,379!

Year		2017			2018			Diff
Month		Jun	Jul	Aug	Jun	Jul	Aug	
Property Name								
Anthony Middle School				221724			124396	97328
Aragon Middle School		265649	280997	293235	211706	241581	179523	207071
Campbell Middle School		283613	315817	298119	267407	241281	263662	125200
Cook Middle School		163267	168263	205299	142026	257695	219931	-82823
Cypress Creek High School		523180	577351	647369	491055	494516	624801	137528
Cypress Fairbanks High School				744448			377688	366760
Cypress Falls High School		556524	609126	710446	582669	533709	494682	265036
Cypress Lakes High School		440368	500206	544085	438015	499516	364251	182877
Cypress Park High School				205405			138051	67354
Cypress Ranch High School		517446	601080	657402	558528	582196	304174	331029
Cypress Ridge High School		440633	483868	595425	544410	559426	470241	-54151
Cypress Springs High School		392895	543231	683924	399387	491687	355819	373157
Dean Middle School		236926	383866	427301	238652	227255	151739	430448
Hopper Middle School		222062	208653	235515	186407	234753	155380	89690
Jersey Village High School		437830	463428	500139	409462	429231	374266	188438
Kahla Middle School		212932	231700	255232	264798	252676	175251	7139
Langham Creek High School		419002	487944	534568	402634	285477	324273	429129
Salyards Middle School		178185	188273	207787	181204	188656	153134	51251
Spillane Middle School				205692			113768	91925
Thornton Middle School		213868	224404	225540	159159	123933	232783	147937
Truitt Middle School		163367	169058	187430	88598	54429	213796	163032
				20691088			17075737	3615351
								0.06
								$216,921
							CDD Adj	1.09366391
							TOTAL SUMMER SHUTDOWN SAVINGS	$237,239

NATURAL GAS

The District just signed a contract to switch all natural gas accounts from the CenterPoint General Service Rate to a new CenterPoint Transport Rate. The savings will total approximately **$268,204 annually**, depending on the current natural gas prices (which includes a lot of savings from fixed customer charges); this is over and above the $150,000 plus savings which CFISD has benefited from other similar contracts we have signed (over the last 2 ½ years). It's also a win for CenterPoint when they make their rate case before the PUC (helps them with their MCF/customer ratio). This rate change was approved by Roy Sprague and Matthew Morgan. About one quarter of the savings will occur in buildings not managed by Facilities; still, these rate savings will be realized by the

District. These rate contracts are for one year and are set up for auto-renewal (Evergreen Clause).

Estimated Full Requirements (Load Following) Service with CES

	Actual Volumes (MMBTU)	Houston Ship Channel Index	Total Contract Adder	Citygate Gas Cost	Baseload Gas Charge	LDC Transport Charge	Applicable Taxes	**Est. Bill Amount**	Est. Cost of Gas Per Mmbtu
Jul-18	3564	$3.01	$0.2500	$3.38	$12,028.59	$9,240.35	$17.93	**$21,286.87**	$5.9727
Jun-18	4472	$3.03	$0.2500	$3.40	$15,184.09	$9,526.49	$22.50	**$24,733.07**	$5.5301
May-18	7399	$2.91	$0.2500	$3.28	$24,232.27	$10,425.38	$37.22	**$34,694.87**	$4.6890
Apr-18	10600	$2.77	$0.2500	$3.14	$33,229.59	$11,389.94	$53.32	**$44,672.84**	$4.2146
Mar-18	11313	$2.61	$0.2500	$2.98	$33,656.94	$11,572.65	$56.91	**$45,286.50**	$4.0030
Feb-18	20558	$2.06	$0.2500	$2.43	$49,852.01	$14,157.92	$103.40	**$64,113.33**	$3.1187
Jan-18	31672	$2.50	$0.2500	$2.87	$90,739.58	$17,705.35	$159.31	**$108,604.24**	$3.4291
Dec-17	20360	$2.62	$0.2500	$2.99	$60,774.71	$14,333.79	$102.41	**$75,210.91**	$3.6940
Nov-17	10959	$2.83	$0.2500	$3.20	$35,014.64	$11,514.20	$55.12	**$46,583.96**	$4.2507
Oct-17	10781	$2.78	$0.2500	$3.15	$33,907.38	$11,448.15	$54.23	**$45,409.76**	$4.2119
Sep-17	7350	$2.79	$0.2500	$3.16	$23,189.79	$10,392.06	$36.97	**$33,618.82**	$4.5739
	139029						Annual Total	**$544,215.19**	$4.01

Proposed Annual Savings compared to Utility **$268,204.52**
Proposed Annual Savings per MCF **$1.98**
Percentage Savings **33%**
Tax Rate **0.00503**

City Gate Cost = Upstream Fuel + Adder + Upstream Transport
Baseload = Volume X Citygate
LDC Transport = Volumes charge calculated per Rate Schedule
Taxes = Volume X Tax Rate

ENERGY WATCHDOG

Sonia has had all the bills imported to the new energy accounting software. We will likely be using Energy Watchdog from here on out. Our next energy report is likely to look little different! Please let me know if you would like any new information added into the Energy Report (or taken out). I'll be including some new graphs and will likely include water and gas.