Management Audit of the District Energy System City of Nashville, Tennessee

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tatc consulting

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1. Introduction and Executive Summary

TATC Consulting was engaged by the Metropolitan Government of Nashville and Davidson County (Metro) to conduct a study of its District Energy System. The study's objectives were concisely outlined, and included the following:

- To conduct a comparison of the District Energy System performance with that of the Nashville Thermal Transfer Corporation, which it replaced, to determine if the projected cost savings have been realized
- To determine if the District Energy System is performing well for its customers
- To determine if the contract with Constellation Energy Source is being adequately monitored

The project team has conducted its analysis of District Energy System operations, and provides determinations as to whether each of the study objectives outlined above has been met. In the following pages, we restate the questions to be answered, provide analysis regarding the degree to which each of the objectives has been met, and provide a summary determination. To summarize the results, we provide the following:

- To the question of whether the projected cost savings have materialized, the project team found that they have not only materialized, but appear to be greater than were originally estimated through the current year.

- To the question of whether the District Energy System is performing well for its customers, the project team found that it appears to be performing well for its customers on almost any objective measure. This is particularly true as the performance of the DES plant is concerned, as reliability has risen markedly as compared to the Thermal Plant. It is also true as it relates to customer attitudes, with the one caveat that customers are divided as to whether they receive "a good price for service." However, the project team believes that some customers may have expressed some reservations in this regard due to general increases in the cost of natural gas.

- To the question of whether the contract with Constellation Energy Source is being adequately monitored, the project team found that there have been no substantive violations of the contract by the contractor in operating the District Energy System. Further, the previous contract administrator overseeing this contract (GBB) appears to have fulfilled its contractual obligations as well. The project team does, however, recommend that Metro assume a more

aggressive role in the oversight of the contract administrator regarding compliance with contractual terms.

The history of energy systems in Nashville is a lengthy one, but one with which the reader should have at least some familiarity in order to understand the discussion regarding contract compliance, customer service and, particularly, cost comparisons between the current District Energy System and the former Nashville Thermal Transfer Corporation. There have been many volumes of data, discussion, correspondence and cost scenarios generated over a period spanning over three decades relating to both the Thermal Plant as well as the District Energy System. The project team has attempted to summarize the important points over this period of time in the following section. Following this background section are discussions relating to each of the three questions posed in this study.

2. BACKGROUND

In 1973, Metro, through the establishment of the Nashville Thermal Transfer Corporation, or NTTC, (henceforth referred to as "Thermal") began operating a waste to energy plant on an 11 acre site on the southeastern edge of the downtown area on the waterfront of the Cumberland River. Thermal operated continuously from 1974 through May, 2002, at which time a fire destroyed the facility. At the time, this was one of the most technologically innovative plants in the country, converting solid waste to energy. This energy was utilized to produce steam and chilled water, and deliver it to 39 downtown customers via an underground conveyance system which is, in large part, utilized today by the new District Energy System (DES). At times when insufficient volumes of solid waste were available to generate steam and chilled water, the plant utilized two gas/oil fired boilers as an alternative.

Over the years, there were several capital improvements made to Thermal. These are summarized as follows:

- In 1976, electrostatic precipitators were installed to reduce air emissions, at a cost of approximately $8 million
- Between 1984 and 1986, the facility underwent a $36 million expansion, enabling the generation of electricity, thus expanding its capability to serve downtown heating and cooling customers.
- In 1999, the pollution system was replaced with a combination-baghouse scrubber system in order to conform to newly-enacted amendments to the Clean Air Act.

Thermal Operating Subsidies

It is not the purpose of this study to exhaustively analyze Thermal costs, as its operations ceased entirely in May, 2002, and were subsequently replaced by DES. However, it is instructive to place the

discussions and eventual decision to replace Thermal within the context of the level of subsidies it required from the Metro government over an extended period of time. The following table presents these subsidies, as well as the tonnage of solid waste processed and the processing costs per ton from 1975 through 2000. (Figures obtained from Annual Reports to NTTC by Peat, Marwick, Mitchell and R.W. Beck).

Year	Metro Subsidy	Tons of Solid Waste Processed	Cost per Ton Processed
1975	$150,000	57,210	$2.62
1976	$650,000	90,830	$7.16
1977	$1,275,000	105,972	$12.03
1978	$1,300,000	140,973	$9.22
1979	$1,300,000	120,000	$10.83
1980	$1,300,000	118,730	$10.95
1981	$1,300,000	131,664	$9.87
1982	$1,500,000	120,889	$12.41
1983	$1,500,000	145,641	$10.30
1984	$1,500,000	168,508	$8.90
1985	$2,500,000	188,307	$13.28
1986	$2,500,000	175,865	$14.22
1987	$2,545,000	240,286	$10.59
1988	$2,636,620	338,054	$7.80
1989	$2,684,079	313,507	$8.56
1990	$2,748,496	319,418	$8.60
1991	$2,814,456	329,289	$8.55
1992	$3,183,708	319,004	$9.98
1993	$3,955,413	334,306	$11.83
1994	$4,540,584	323,505	$14.04
1995	$5,006,842	307,283	$16.29
1996	$5,796,763	298,250	$19.44
1997	$5,796,763	305,384	$18.98
1998	$6,208,799	299,927	$20.70
1999	$7,636,273	250,436	$30.49
2000	$7,788,000	246,574	$31.58

As can be seen from the table, not only were the subsidies from Metro increasing steadily and at an accelerating rate, so too were the processing costs per ton, while at the same time, the volume of solid waste entering the plant was in general decline after around 1988.

Reliability of the Thermal Plant

Exacerbating a seemingly deteriorating position in terms of the delivery of sufficient volumes of solid waste to Thermal was a steadily declining reliability of the plant itself. According to a presentation ("NTTC Transition Period Operations and Budgets Update") made by Greshman, Brickner and Bratton (GBB) and HDR Engineering to the Metro Finance Director in November, 2001:

- "Extensive Boiler Repairs done in Spring 2001 have not had the desired results"
- "YTD (7/01-9/01) Boiler Availability: 61.9%." (According to an Oct. 15, 2000 report by HDR, reliability for facilities of this type should be approximately 85%.)
- "Boiler problems have required $490,000 more in EOM funds than budgeted. "
- "Continuing Boiler Reliability Problems Have Required Much More Extensive Tube Repairs to be Done"
- "Combination of Boiler Leaks and Inadequate Instrumentation Led to Complete Failure of all 10 Baghouses"
- "Capital Project for Bags and Cages Required Approximately $200,000 In Additional Funds" (emphasis original)

Clearly, the facility itself was in a declining state of repair, and a number of period reports and presentations did not present optimistic prognoses for the future.

Solid Waste Management

As was noted above, the Thermal plant required the delivery of solid waste in order to produce steam and chilled water for its customers. The Plant had a rated capacity of 1,050 tons per day, however in December, 2000, it was estimated that Metro controlled the delivery of only approximately 450 tons of solid waste per day, and was burning about 685 tons per day from all incoming sources. It was further estimated that, in order to run efficiently, the Plant required about 900 tons per day, so the plant was receiving about 76% of the volume necessary. Somewhat paradoxically, it was during this period that anecdotal reports indicated that severe backups of refuse vehicles occurred as they attempted to deliver waste to Thermal.

At the time, Metro's cost of disposal at Thermal was approximately $84 per ton (see, "Anatomy of a Partnership: Nashville's New District Energy System", June 11, 2006, presented at the 97th Annual Conference of the International District Energy Association). This compared unfavorably to tipping fees offered by private landfills of approximately $26.10 per ton. This inequity presented problems for the

Thermal Plant in attracting sufficient volumes of solid waste in the future, and was one of the factors which led the Metro Government to assess alternatives to its continued operation. Compounding this problem was a Supreme Court decision in 1994 (the "Carbone" decision) which held that municipalities could not direct the method of disposal of solid waste collected by private haulers within its borders. Further, Metro had rejected as politically infeasible the attraction of solid waste from outside its borders, and had also rejected the expansion of collection efforts through internal means. This entire scenario was occurring at a time when Metro wished to promote an initiative to increase the overall recycling rate, which, if successful, would have further diminished the total volume of waste entering the facility. It is, then, within this context that Metro began to weigh the feasibility of continued operation of the Thermal Plant against the potential construction of a new fossil fuel plant.

3. Analysis and Discussion

Now that there have been almost four years of continuous operation of the District Energy System, Metro desires to assess whether the investment in DES has been advantageous in comparison to Thermal. To accomplish this, it developed a Request for Proposal to gain insights regarding three points. These were as follows:

- Comparison of the District Energy System performance to the Nashville Thermal Transfer Corporation it replaced to determine if projected savings have been realized.
- Determination as to whether the District Energy System is performing well for its customers.
- Determination as to whether the contract with Constellation Energy Source is being adequately monitored.

In the following pages, the project team restates each of the questions posed in Metro's Request for Proposal, and provides analysis, discussion and a determination relating to the degree to which each of these questions has been affirmatively addressed in the preceding four years of operations by DES.

Question 1: In comparing the District Energy System to the Nashville Thermal Transfer Plant that it replaced, have the projected cost savings been realized?

As was noted above, the costs associated with operating Thermal were escalating rapidly by 2000, as were the associated subsidies required of the Metro Government. This precipitated a need to examine both the future costs of Thermal operations and those that may have been associated with alternatives.

Prior to the fire that destroyed the Thermal Plant in May, 2002, several studies were conducted that attempted to quantify the net present values associated with various alternatives in this regard. A report issued by PriceWaterhouse Coopers on November 1, 2000, outlined three alternatives, with various scenarios, for consideration by Metro in its decision process to determine the future of energy generation. These alternatives, briefly stated, were as follows:

Base Case Scenarios	Total Present Value (in 2000) of All Future Net Metro Costs
Alternative I: Continue Thermal as a Waste to Energy Plant	
Scenario A: Continue operations at Thermal as is with no significant modifications	$112,256,084
Scenario B: Continue operations at Thermal but with moderate infrastructure modifications/upgrades	$73,771,483
Scenario C: Continue operations at Thermal but with significant infrastructure modifications/upgrades; waste needs determined by energy requirements	$123,250,249
Alternative II: Take existing (at the time) Thermal waste to energy (WTE) plant out of service and build a new fossil fuel facility on the existing site instead.	$230,482,144
Alternative III: Clear the existing (at the time) Thermal WTE facility with all heating/cooling operations ceased, and responsibility for these functions within the Loop become those of the existing customers.	$316,580,464

Clearly, the alternative with the lowest associated costs for Metro at the time were those associated with Scenario B of Alternative I, which was to continue operations at Thermal with moderate infrastructure upgrades and modifications. Further, the three alternatives with the lowest calculated net present values each involved continued operations of the Thermal Plant. (However, it must be noted that, in analyzing these alternatives, it is apparent that no consideration was given to the potential land value and tax revenue from the sale of the Thermal site). This, however, became a moot point in May, 2002, when fire damaged the Thermal Plant to an extent that made future operations infeasible. The alternative with the next-lowest associated net present value was that of taking Thermal out of service and building a new fossil fuel plant at that site.

The project team was asked to determine whether the projected costs savings associated with the replacement of the Thermal Plant with the new District Energy System have been realized. In pursuing this objective, it became clear that any cost savings that were estimated in this transition were (a) predicated upon the option of replacing the Thermal Plant, which was removed from consideration after the fire in 2002, and (b) based on the projected useful remaining lives of the two facilities. In the case of the Thermal Plant, this was, again, rendered moot after the fire. However, as was shown above, the calculated net present values of the respective options clearly indicated that, at the time, there were no net costs savings expected from the transition to fossil fuel operations, as the net present value of this option was almost $157 million more than making modifications to the Thermal Plant.

As was noted earlier in this report, Metro was heavily subsidizing operations at the Thermal Plant. By the year 2000, this subsidy had reached a level of $7,788,000, and was rising steadily. Two years later, in 2002, Gershman, Brickner and Bratton (GBB) developed a cost projection spreadsheet that calculated that Metro had spent $14,204,400 to subsidize operations in that year, and projected that these subsidies would rise at a rate of 2.5% annually through 2023, reaching a level of more than $24,000,000. Although the project team was unable to validate either the starting subsidy level or the assumed rate of increase in discussions with GBB, these assumptions do not appear to be have been unreasonable, and in fact may have been conservative given that the increase in these subsidies was over 9.2% annually from 1995 through 2000. The spreadsheet calculation made by GBB, reproduced below, is the only calculation discovered by the project team that projects any cost savings through making the transition from the Thermal Plant to a fossil fuel facility, and is thus used for purposes of this report to determine whether the projected cost savings have been realized.

Year	Thermal Metro Fee Estimate	Transfer and Disposal Costs	Savings	Thermal Debt Service	Net Savings	Cum Savings
2002	$14,204,400	0	$14,204,400.00	$9,338,510	N/a	
2003	$14,914,620	0	$14,914,620.00	$9,343,814	N/a	
2004	$15,287,485.50	$4,266,500	$11,020,985.50	$9,338,433	$1,682,552.50	$1,682,552.50
2005	$15,669,672.64	$4,373,162.50	$11,296,510.14	$9,341,883	$1,954,627.14	$3,637,179.64
2006	$16,061,414.45	$4,482,491.56	$11,578,922.89	$9,337,953	$2,240,969.89	$5,878,149.53
2007	$16,462,949.81	$4,594,553.85	$11,868,395.96	$9,335,828	$2,532,567.96	$8,410,717.49
2008	$16,874,523.56	$4,709,417.70	$12,165,105.86	$4,866,518	$7,298,587.86	$15,709,305.35
2009	$17,296,386.65	$4,827,153.14	$12,469,233.51	$4,867,078	$7,602,155.51	$23,311,460.86
2010	$17,728,796.32	$4,947,831.97	$12,780,964.35	$4,870,328	$7,910,636.35	$31,222,097.21
2011	$18,172,016.22	$5,071,527.77	$13,100,488.46	$4,868,138	$8,232,350.46	$39,454,447.66
2012	$18,626,316.63	$5,198,315.96	$13,428,000.67	$4,146,755	$9,281,245.67	$48,735,693.33
2013	$19,091,974.54	$5,328,273.86	$13,763,700.68	$3,341,563	$10,422,137.68	$59,157,831.01
2014	$19,569,273.91	$5,461,480.71	$14,107,793.20	$3,343,275	$10,764,518.20	$69,922,349.21

2015	$20,058,505.76	$5,598,017.73	$14,460,488.03	$0	$14,460,488.03	$84,382,837.25
2016	$20,559,968.40	$5,737,968.17	$14,822,000.23	$0	$14,822,000.23	$99,204,837.48
2017	$21,073,967.61	$5,881,417.37	$15,192,550.24	$0	$15,192,550.24	$114,397,387.71
2018	$21,600,816.80	$6,028,452.81	$15,572,363.99	$0	$15,572,363.99	$129,969,751.71
2019	$22,140,837.22	$6,179,164.13	$15,961,673.09	$0	$15,961,673.09	$145,931,424.80
2020	$22,694,358.15	$6,333,643.23	$16,360,714.92	$0	$16,360,714.92	$162,292,139.72
2021	$23,261,717.10	$6,491,984.31	$16,769,732.79	$0	$16,769,732.79	$179,061,872.51
2022	$23,843,260.03	$6,654,283.92	$17,188,976.11	$0	$17,188,976.11	$196,250,848.62
2023	$24,439,341.53	$6,820,641.02	$17,618,700.52	$0	$17,618,700.52	$213,869,549.14

As can be seen from the table above, since the figures under the heading, "Thermal Debt Service" represent fixed quantities, there are only two columns which contain estimated costs. The first, the "Thermal Metro Fee Estimate," represents the annual subsidy from Metro to fund continued operations at the Thermal Plant. And as has been noted above, these costs were projected to rise at a conservative 2.5% per year versus the then-recent experience of over 9.2%. In any event, the veracity of these figures is undeterminable, as the Thermal Plant was destroyed and replaced by the DES facility. The estimation of the accuracy of these figures, then, hinges upon the acceptance or rejection of the likelihood that these costs would have continued to escalate at an annual rate of 2.5%. The project team makes no judgment in this regard, but rather points out again that this appears to have been substantially below that of the most recent previous years. Clearly, though, had these subsidies been closer to the then-recent experience of 9.2% per year, the projected cost savings would have been even greater.

The second column, the "Transfer and Disposal Costs," represents the costs that Metro would incur by disposing of waste at a landfill as opposed to the then-current method of disposing of these wastes at the Thermal Plant. Therefore, the determination as to whether the projected cost savings have been realized is a matter of determining whether the estimates made of the potential costs for disposing of wastes at a local or regional landfill have materialized.

At the time the transfer and disposal costs were estimated by GBB, the tipping fee, or the fee that waste haulers pay to dump solid wastes at the landfill, was believed to be approximately $26.10 per ton. However, this tipping fee turned out to be somewhat less than this, and resulted in some cost savings that were not reflected in GBB's original projections. The project team obtained the actual transfer and disposal costs that Metro has incurred since FY 2004, and has presented these in the table below. For convenience of comparison, the projected costs for calendar years 2004 through 2007 are reprinted in the table alongside those of the actual costs for the comparable fiscal year, although it must be specifically noted that comparison of fiscal years to calendar years is not a true basis for exact comparison.

Year	Actual Transfer and Disposal Costs (Fiscal Year)	Projected Transfer and Disposal Costs (Calendar Year)	Difference
2004	$4,229,000	$4,266,500	$37,500
2005	$3,593,000	$4,373,163	$780,163
2006	$3,877,000	$4,482,492	$605,492
2007 (projected actual costs)	$3,708,000	$4,594,554	$886,554
Total (4 years)	**$15,407,000**	**$17,716,709**	**$2,309,709**

Therefore, with the caveat that one cannot directly compare projected calendar year costs to those accrued on a fiscal year basis, it would appear that the savings have, in fact, materialized given that the four-year total actual cost of $15,407,000 is $2,309,709 less than the projected transfer and disposal cost estimated in the projections of 2002 when the decision as to whether the Thermal Plant should be replaced was made.

Determination: There were multiple cost projections made regarding the feasibility of replacing Thermal with a fossil fuel plant. As all of these were made prior to the fire that effectively destroyed the Thermal Plant, the decision became not whether to replace Thermal, but rather whether the projected transfer and disposal costs estimated in 2002 materialized. As the project team has shown, these cost savings have not only materialized, but appear to be greater than were originally estimated through the current year.

Question 2: Is the District Energy System performing well for its customers?

There are multiple factors which influence the determination as to whether the DES is performing well for its customers. One such factor is the degree of compliance with contractual requirements, and as will be shown in the next section of this report, CEPS has not failed to comply with any substantive element of the contract. There have been several occasions in each year in which boilers, chillers, chiller pumps and other operating equipment have tripped off line, causing interruptions in service, and these are documented both in the monthly operations reports as well as the annual reports that CEPS prepares and provides to Metro. In comparison to the Thermal Plant which it replaced, DES reliability

has been far superior, especially in comparison to Thermal's latter years of service. As was noted earlier in this report, boiler reliability at Thermal had dropped to 61.9% in 2002. By comparison, DES steam reliability was 99.86%, and chilled water reliability was 99.82% in 2006.

Perhaps the most reliable method of determining whether DES is performing well for its customers, however, is in surveying these customers regarding their satisfaction. Metro surveyed all 22 customer contacts, representing 40 buildings in both FY06 and FY07. Although the response rates were somewhat disappointing (6 returned surveys in FY06 and 7 responses in FY07), the responses received covered a majority of buildings (one customer contact may have responsibility for multiple buildings) and were generally very positive. (See the attached summaries in Appendix A of this report). The following points summarize the highlights of these surveys:

- In both surveys, 100% of customers indicated that they were satisfied with both chilled water and steam service provision.

- On a scale of 1 to 5, with 1 being the "best", all respondents in both surveys gave scores of 1 or 2 when asked if they were confident that problems would be solved in a timely manner.

- On a scale of 1 to 5, with 1 being the "best", all respondents in both surveys gave scores of 1 or 2 when asked if the service provided by DES is dependable.

- Although only 2 surveys in FY06 gave responses to the question of whether they were "getting a good price for service", both of these respondents indicated that they were. In FY07, the same question was asked in the survey, with a total of 4 of the 6 total responses indicating that they believed they were getting a good price for service. (It should be noted that the pricing structure is somewhat higher for services provided through DES as compared to the Thermal Plant. This is at least partially due to the existence of the heavy subsidies that Metro was making at the time to continue Thermal operations.)

- All 6 of the respondents in FY06 had read the newsletter published by DES. In FY07, only 4 of the 7 respondents indicated that they had done so, although all in both surveys indicated that the information contained in the newsletter was useful.

- All 6 respondents in FY06 and all 7 in FY07 indicated that the annual customer meetings were "of value" to them.

- All 5 of those responding in FY06 and all 6 in FY07 indicated that they were pleased with the experience they had when calling the DES plant.

As can be seen in the survey responses above, those customers who actually responded indicated generally very favorable attitudes toward DES operations. The only area in which these positive responses were tempered was in the attitudes toward cost. In attempting to understand the reasons for this relatively low rating in the user survey, it is instructive to examine the unit costs charged to customers for steam and chilled water in the last year of Thermal operations compared to those charged today. The table below summarizes these comparative unit costs. (Note: steam units are expressed in cost per lb. Chilled water usage is expressed in cost per ton-hour)

Customer Category	Thermal 2003	DES 2004	DES 2005	DES 2006	Annual Percentage Change
STEAM					
Private Customers	$16.60	$19.83	$25.74	$26.74	**17.2%**
State Customers	$15.07	$15.17	$21.00	$23.95	**16.7%**
Metro Customers	$22.87	$25.82	$31.86	$28.47	**7.6%**
CHILLED WATER					
Private Customers	$0.17	$0.14	$0.15	$0.16	**(2.0%)**
State Customers	$0.15	$0.14	$0.15	$0.16	**2.1%**
Metro Customers	$0.19	$0.21	$0.23	$0.18	**(1.8%)**

As can be seen from the table above, the unit costs charged to customers, particularly for steam, have risen significantly since 2003. However, this has been primarily due to the increase in the price of natural gas, which is a pass-through cost to customers. Although the respondents were not queried regarding the reasons for their responses, it is likely that this increase had an effect on the attitudes of customers toward the costs of DES service provision relative to those of the Thermal Plant. To illustrate this potential effect, the following table presents the annual costs paid by CEPS per dekatherm for natural gas, by month:

Month	Natural Gas Cost per Dekatherm		
	FY04-05	FY05-06	FY06-07
July	$ 6.938	$ 8.471	$ 8.938
August	$ 6.816	$ 8.811	$ 9.565
September	$ 6.482	$ 9.585	$ 8.915
October	$ 7.372	$ 10.836	$ 8.400
November	$ 7.665	$ 10.679	$ 9.682
December	$ 7.725	$ 10.335	$ 10.668
January	$ 7.689	$ 10.078	$ 9.877
February	$ 7.680	$ 8.615	$ 9.820
March	$ 7.449	$ 8.440	$ 10.472
April	$ 7.492	$ 8.546	$ 9.651
May	$ 7.502	$ 8.381	
June	$ 7.845	$ 8.592	
Average	**$ 7.485**	**$ 9.436**	**$ 9.742**
Year Over Year Increase	**NA**	**26.1%**	**3.2%**

As can be seen from the table above, there was an almost 30% increase in the prices CEPS paid to gas suppliers for the provision of natural gas. These costs were passed along to customers in their monthly invoices, with the probable effect that at least some of these customers attributed the rapid price increases to generally higher operating costs of DES.

Determination: The District Energy System appears to be performing well for its customers on almost any objective measure. This is particularly true as the performance of the DES plant is concerned, as reliability has risen markedly. It is also true as it relates to customer attitudes, with the one caveat that customers are divided as to whether they receive "a good price for service." However, it is likely that much of this attitude is related to the general increases in natural gas prices to provide service to the customers – a cost that is simply passed through to the customers.

Question 3: Is the Contract with Constellation Energy Source Being Adequately Monitored?

Metro has a contract with CEPS to operate the District Energy System and the Energy Distribution System which conveys steam and chilled water to customers. It also has a contract with CEPS to assist in the procurement of fuel for the facility. These contracts are overseen by a contract administrator (GBB, at the time of the project team's on site activities), with whom Metro has a separate contract for services. Therefore, there are two primary elements to consider when assessing whether the contract with CEPS is being adequately monitored, as stated below:

- Has the contract administrator fulfilled its obligations as stated in its contract with Metro?
- Has the contract administrator ensured that the obligations of CEPS in its contract with Metro have been fulfilled?

The project team analyzes these two elements in the following pages.

Assessment of Contract Compliance of the Contract Administrator

In order to assess the effectiveness of contract oversight and monitoring, it is important to know and understand the requirements of the contractor responsible for these activities as outlined in Metro's contract with Gershman, Brickner and Bratton (GBB). In 2002, Metro entered into a contract with GBB to oversee Metro's contract with Constellation Energy Source, subsequently known as Constellation Energy Projects & Services Group (CEPS). There were eight primary areas of responsibility assigned to GBB in the contract, as defined in Amendment Number 2 to the Contract, dated April 9, 2004. These are summarized below:

1. Provide the feasibility report for the forthcoming revenue bond issue authorized by the Metro Council
2. Continue to provide coordination and development services so that project revenue bond financing is reached as soon as practicable working closely with Metro's Finance Team.
3. Continue to provide coordination and oversight to the administration and operations of Nashville Thermal Transfer Corporation though the time deconstruction and site clearing has been completed
4. Continue to provide the necessary coordination and administrative oversight to assure that the responsibilities Metro has assumed in the Agreements are performed in a timely manner during the construction period, including necessary reporting to Metro and Bondholders
5. Continue to provide similar oversight during the initial years of commercial operations, including necessary reporting to Metro and Bondholders

6. Advance the continued development of district energy services to new customers that are in proximity to the existing EDS (or, Energy Distribution System) and EGF (or, Energy Generation Facility)
7. Provide public relations and communications support related to the District Energy System and related activities as directed by Metro
8. Hold meetings with Metro management

The first four of the above tasks were related to the construction period for the new DES facility, and as such are not considered to be pertinent for purposes of this report to the determination as to whether Metro's contract with CEPS is being properly monitored. Tasks 5 through 8 relate to current operations, and the extent to which the contract administrator (GBB, at the time of the initiation of this project) has complied with the terms of the contract is evaluated below:

Category Description	Comment
Task 5: Provision of oversight during initial years of operation	GBB reviewed and approved monthly invoices CEPS prepares for billing customers. GBB performed monthly monitoring of operations and maintenance, and issued a monthly "Operations Monitoring Report." This report commented upon such items as reliability, preventive maintenance, safety, facility condition, environmental compliance, efficiency of operations, customer service and sales and marketing. GBB provided an annual report summarizing operations and maintenance. GBB, through its subcontract with McNeely, Piggot and Fox, updated the DES web page of the Metro web site with information related to DES operations.
Task 6: Advancement of the continued development of district energy services to new customers	Working with CEPS, GBB advanced DES services to new customers over the course of its contract as contract administrator, successfully recruiting multiple new customers.
Task 7: Provision of public relations and communications support related to the DES	Through its subcontract with McNeely, Piggot and Fox, GBB provided DES with counseling, public relations, marketing and communications support.
Task 8: Meetings with Metro management	GBB held monthly meetings with the Director of Metro Finance during the course of its contract as contract administrator.

Therefore, although the project team cannot verify the quality or value added by the contract administrator, it appears that GBB, as the contract administrator at the time, fulfilled its obligations as stated in the contract.

As was noted in the table above, GBB appears, in retrospect, to have performed certain actions related to each of the operational tasks listed in the contract. However, it is important that Metro assure that these duties are fulfilled on an ongoing basis. In July, 2004, the Mayor established the District Energy System Advisory Board, through Executive Order No. 20, with the following responsibilities:

1. To review monitoring reports and annual plans and budgets of the system and make reports and recommendations to the Mayor and Metropolitan Council regarding the Metropolitan Government's use of and reliance on the District Energy System;
2. To review monitoring reports and annual plans and budgets of the system and make reports and recommendations to the Mayor and Metropolitan Council regarding ongoing compliance with all applicable laws, regulations and relevant bond covenants related to the District Energy System;
3. To make reports and recommendations to the mayor and Metropolitan Council regarding the Metropolitan Government's relationship with the system's operator, Constellation Energy Source, Inc. ("CES") and its successors, and;
4. To make reports to the Mayor and Metropolitan Council regarding the Metropolitan Government's relationship with the customers of the District Energy System, specifically including the consistency, quality and cost effectiveness of the services provided to customers.

Therefore, although the Advisory Board monitors the relationship of Metro with the system operator and customers, there is no formal mechanism in place to ensure compliance of the contract administrator with the terms of its contract with Metro. The first responsibility of the Advisory Board requires the monitoring of reports and annual plans and budgets of the system, yet does not directly require the determination of compliance of the contract administrator with the terms of its contract with Metro.

Assessment of Contract Compliance of the System Operator

On December 6, 2005, Metro and CEPS entered into an amended agreement ("Amended and Restated Contract for the Design and Construction of an Energy Generation Facility, Improvement of an Energy Distribution System, and Long Term Operation and Management of the Nashville Energy System") for CEPS to perform a variety of services related to design, construction and operation of DES. Known as "ARMA", for the "Amended and Restated Management Agreement", this contract outlined the specific services for which CEPS would be responsible. Many of these responsibilities are related to the design, construction and acceptance testing of the facility and its components. These are related to the original construction of the facility and, as such, are assumed by the project team to have been successfully accomplished to the two parties' satisfaction, and are thus not considered in this evaluation of the performance of the contractor in determining if the "contract with Constellation Energy Source is being adequately monitored."

In order to evaluate the effectiveness of the monitoring function, it is necessary to define the contractual terms, as outlined in the ARMA, of performance required of CEPS. The following table summarizes the pertinent sections of the ARMA, Article XII, "Operation, Maintenance, Repair and Replacement."

Category	Description	Comment
Staffing and Training	The Contractor shall be responsible for training the Service Manager, operations supervisors and other necessary staff to perform the services under the Contract. The Contractor covenants that it will interview and give priority to current Thermal employees for positions to which they are qualified when staffing the facility and the EDS, consistent with Applicable Law.	CEPS has fulfilled this criterion, as all staff have been trained to perform the services required. CEPS interviewed all former Thermal Plant employees who desired employment, and hired 19 of the former Thermal employees.
Maintenance	The Contractor, at its expense, will maintain the System in accordance with the Contract Standards, including Prudent Utility Practice, Applicable Law, Performance Guarantees and the Required Insurance; will comply with a detailed preventive and predictive maintenance plan and operation and maintenance manual; and will keep complete daily and annual maintenance logs. The Contractor shall develop and maintain a comprehensive, computerized maintenance management system to plan and manage predictive and preventive maintenance and equipment inventories. The Contractor will also maintain a spare parts inventory in accordance with Prudent Utility Practice. The Contractor must provide (monthly and annually) a detailed accounting and proofs of maintenance tasks undertaken and related costs. All scheduled maintenance shall be done in a way that requires the minimum reduction or cessation of energy delivery services consistent with Prudent Utility Practices. The Contractor shall be responsible for maintaining the Facility grounds, including fencing, lighting, signage, litter removal, lawn mowing, leaf raking and brush cutting. The Facility will be returned to Metro at end of the Contract term in well maintained, functional condition. The Contractor shall make	The project team did not perform an exhaustive analysis of preventive maintenance (PM) and repair activities to determine whether these are adequate and comprehensive. Rather, the project team analyzed Operations Reports to determine whether a PM program exists, and whether activities performed under the program are reported on a regular basis, and that they identify maintenance and repair efforts in a predictive manner. This appears to be the case, as each monthly Operations Report documents EDS Routine and Preventive Maintenance, as well as Facility Maintenance, including all PM. The contract monitor has access to the CMMS ("I-Maint") and assesses the activities performed under the PM program. The grounds of the DES facility are evidently well-maintained, and the routine maintenance, such as lawn mowing and other activities, are documented in the monthly

Category	Description	Comment
	commercially reasonable efforts to keep the EDS in good condition. All repairs, replacements, and improvements to the EDS shall be maintained by the Contractor and shall be returned to Metro in good condition, normal wear and tear excepted.	Operations Report.
Customer Connections	The Contractor shall be responsible for installing (to the extent not already existing), operating and maintaining the metering and interconnections of Customers with the EDS.	CEPS initiated and completed a full meter replacement program in 2006. This was in response to several instances in the Operations Monitoring Reports which indicated that "metering accuracy has been reported as an issue since EGF startup."
Streets/Traffic	The Contractor shall repair and maintain any streets, sidewalks, public right of ways, utilities, or other property damaged by the operation and maintenance of the Facility or the EDS.	CEPS has restored streets and sidewalks on those occasions on which utility lines are put in place. These restorations are performed to Metro specifications and standards.
Computerized Maintenance Management System	The Contractor shall maintain all maintenance records in accordance with the Computerized Maintenance Management System (CMMS) guidelines. Such records shall be accessible electronically at all times to Metro oversight personnel and Metro's authorized agents. The Contractor shall include CMMS summaries in its monthly and annual reports.	CEPS uses "I-Maint" as its computerized maintenance management system (CMMS). These records are accessible at all times by Metro and the contract monitor at terminals located in the DES facility in an office designated for these employees.
Scheduled Outages	Subject to the limitations set forth herein, and to the related obligations of the Customer Contract, the Fuel Purchase Contract, or related customer service contracts, the Contractor is permitted to perform scheduled maintenance during the prescribed time periods. Scheduled maintenance, which is required to be performed with the EDS out of service (cold outage) is limited to two such events per calendar year, and a maximum service interruption of 12 hours each, for steam and chilled water, respectively. Such outages shall be for the express purpose of performing required maintenance on portions of the equipment or EDS which cannot	In 2006, there was a single scheduled outage. This occurred on February 19 and 20, and lasted 12 hours. This was to replace a condenser water valve, install a new metering package and chilled water isolation vales, and to cut and cap an abandoned service line at the Stahlman Building. This outage was reported within 45 days to Metro and within 30 days to the customers.

Category	Description	Comment
	otherwise be repaired, serviced, or replaced "on-line" because of personnel safety or repair feasibility. Such scheduled outages shall also be subject to a minimum of 30 days advance notice, in writing, to all affected customers, and customer concurrence as to timing, and implementation by the Contractor of any special provisions to preclude or mitigate customer service issues. In addition, Contractor shall submit to Metro, for review and comment, a detailed outage plan and schedule at least 45 days prior to any scheduled outage. Subject to all the aforementioned conditions, outages shall be planned only during the month of April or the period from September 15 – October 15, on such weekend or holiday off-peak time selected to minimize customer impacts.	CEPS reports that some outages have been scheduled outside of the stated ranges (e.g., the month of April, and between 9/15 and 10/15), but these were done with permission from Metro. Subsequent to the signing of the contract, it has been determined that the optimum times for scheduled outages occurs in winter and summer, and not during the contractually-stated times. This change is viewed as one which will minimize the impact on customers, and is therefore not viewed by the project team as a violation of the terms of the contract.
Contractor Capital Repair and Capital Replacement	The Contractor shall be responsible throughout the Term for making all repairs and replacements, including major maintenance, repairs and replacements, and upgrading or replacing obsolete equipment, machinery, facilities, structures and improvements constituting the Facility and, subject to **Section 14.04** and **Article XVI**, the EDS (including the tunnel system housing portions of the EDS and direct buried piping systems). Thus, all major maintenance, repair and replacement, whether of an operating or capital nature, shall be the responsibility of the Contractor under the Contract, and be compensated for solely through the Management Fee and as set forth in **Section 14.04**.	There are numerous examples listed in the monthly Operations Reports which give summaries of capital projects and repairs to, for example, chilled water pumps, meters, steam and condensate line replacements, water service connections, etc.
Procedures to Assure Sufficiency of Contractor Maintenance, Repair and Replacement Work.	Metro may, at its expense, perform a maintenance inspection every year and a comprehensive maintenance audit every three years. An exit audit of the condition of the Facility will be performed in Contract Year 14 or the final Contract Year, as appropriate. Such inspections or audits may be used by Metro to review compliance by the Contractor	There have been no annual maintenance inspections or comprehensive maintenance audits performed since the opening of DES, although the language in the contract does not appear to require these inspections.

Category	Description	Comment
	with **Section 12.03**. All such inspections and audits shall be non-invasive and non-destructive.	
Safety and Security	The Contractor shall maintain the safety of the Facility and the EDS and provide a safe workplace at a level consistent with Applicable Law, all Required Insurance, the safety plan and Prudent Utility Practice. The Contractor shall provide for safe and orderly vehicular movement. The Contractor shall be responsible for maintaining the security of the Facility and take all reasonable actions to prevent vandalism to the Facility and the EDS.	CEPS reports on monthly safety meetings in its Operations Report. Examples include CPR topic discussion, fire protection and emergency escape plans, confined space entry oxygen monitor inspections, as well as other topics. The former contact monitor, GBB, reviewed the documentation supplied by CEPS each month. This appears to have been conducted thoroughly. For example, one note made by the contract monitor indicates that CEPS needed to more comprehensively record the specifics related to a crane accident in the log book.
No Nuisance	The Contractor shall be responsible for keeping the Facility neat, clean, and litter-free at all times, to ensure that the operation of the Facility does not create any impermissible odor, litter, noise, fugitive dust, or other adverse environmental effects constituting, with respect to each of the foregoing, a nuisance condition (including a violation of any Applicable Law). Should any such nuisance condition occur, the Contractor shall expeditiously remedy the condition, pay any regulatory fines and indemnify Metro from any third party nuisance claims.	Periodically, the contract monitor conducts "walkthroughs" of the DES facility, making notes on a variety of issues, one of which is facility cleanliness and order. No issues related to cleanliness and order were noted in the 12 months of 2006 by the contract monitor.
Compliance with Permits/Applicable Law	All of the responsibilities that the Contractor and its Subcontractors perform under the Contract must be performed in accordance with Applicable Law (including all applicable Governmental Approvals). The Contractor will remedy any failure to comply with Applicable Law at its expense, bear all loss and expense, and pay any fines and penalties related thereto.	The project team is unaware of any instances of failure to perform in accordance with Applicable Law. Therefore, this particular category of the contract has not been tested.
Utilities and Fuel	The Contractor shall arrange for all Utilities to the Facility. While the Fuel Purchase Contract	Metro and CEPS entered into an Amended and Restated Fuel

Category	Description	Comment
	is in effect, the Fuel Purchase Contract shall govern the matters set forth therein relating to Fuel supplies for the Facility. If the Fuel Purchase Contract is terminated, then Metro shall be responsible for arranging for Fuel supplies necessary to operate the Facility in accordance herewith.	Purchase Contract (ARFA) on December 6, 2005. As part of this contract, Metro receives fuel price hedging services to mitigate the impacts of price fluctuations in natural gas.
Contractor Emergency Response	The Contractor shall immediately respond to all Facility and EDS emergencies (no later than two hours during nights, weekends or holidays), according to its contingency plan, Comprehensive Release Prevention and Emergency Action Plan and Safety Program, promptly correct the condition, and abate any inconvenience to the public or Customers.	The DES facility is staffed 24 hours per day, 7 days per week. Further, all customers are within no more than one mile from the ES plant. It is therefore unlikely that any emergency response would exceed two hours. CEPS logs emergencies and responses, however the project team noted no instance in which the contract monitor reported these response times in its monthly Operations Monitoring Reports. A Contingency Plan, and Comprehensive Release Prevention and Emergency Action Plan were all developed and filed with Metro during the facility construction phase.
Billing, Collection and Metering	The Contractor shall, on behalf of Metro, perform and be responsible for all billing, collection and metering services. The fees collected shall be deposited with the Trustee under the terms of the Trust Indenture. The Contractor shall install and maintain all meters and calibrate them to the level of accuracy specified in the Contract Standards. Meters shall be checked by the Contractor at least annually in accordance with the manufacturer's recommendations. If requested by the Customer, the Contractor will perform such test in the presence of a representative of the Customer. At a Customer's request, the Contractor will conduct such tests on additional occasions. The Contractor shall be liable for the costs of	CEPS produces and transmits monthly invoices to each facility to which it supplies steam and chilled water. These invoices provide each customer information regarding: • Capacity charges • Pass Through charges • Energy Charges These categories of cost are provided for both steam and chilled water. (See Appendix B for a sample customer invoice) Further, CEPS produces a monthly summary which details invoice

Category	Description	Comment
	such additional tests unless such test indicates that the metering equipment provides results that are inaccurate by less than 3% in a manner that is adverse to the Customer, in which case Metro shall reimburse the Contractor for such costs and may charge the Customer. The Contractor shall maintain an accurate log or record of all such tests. The Contractor shall perform all meter reading and billing services on a monthly basis.	amounts for each customer. (See Appendix C for a sample monthly invoice summary). As a part of the ongoing customer service activities of CEPS, its Customer Service Representative responds to complaints of inaccurate meter readings. These instances are documented in the monthly Operations Report. To the extent that these errors result in inaccurate billings to the customer, these are amended and credited to the customer account. CEPS completed a meter replacement program in 2006 for all meters in the system.
Customer Service	The Contractor shall maintain a qualified customer service representative to respond to questions and complaints on a 24 hour per day, 7 days per week basis. The Contractor shall take prompt action to respond to customer complaints and shall deal with customers in a friendly and cordial manner. The Contractor shall investigate each such complaint and communication and, if it has a valid basis, the Contractor shall promptly rectify the matter. All customer communications shall be immediately logged and promptly responded to in writing, faxed to Metro on a daily basis, and reported to Metro as part of the monthly operations reports delivered pursuant to **Section 12.20**. The Contractor shall establish, maintain and make freely known a telephone number, e-mail address and mailing address to which customer complaints and communications may be directed. Complaints and communications concerning service, leaks, breaks and emergencies shall be responded to within two hours and other communications within 24 hours.	CEPS employs a Customer Service Manager who responds to all calls from customers. As was noted above, all customer requests and complaints are noted in the monthly report. The CEPS Customer Service Manager has recently changed the format of the customer complaint and call log to include all such complaints and all calls. These are provided in the Monthly Report. Interviews indicate that customer communications are not faxed to Metro, however, but are logged for Metro's inspection.

Category	Description	Comment
Damages Due to System Interruptions	In the event the Contractor fails to provide Steam and/or Chilled Water or any substitute service reasonably acceptable, for a period exceeding three consecutive days, except due to Uncontrollable Circumstances, the Contractor shall be liable to Metro for any amounts payable by Metro for such failure to provide service to the System Customers. The Contractor shall pay as damages to Metro any amounts Metro owes as damages under the Customer Contracts.	There has reportedly been no instance in which a service interruption lasted longer than 3 hours.
Water Loss	Contractor shall have access to customer premises for determining whether any abnormal leakage of steam, steam condensation and/or chilled water is occurring from the Customer piping system within the Customer's Premises as provided for in the Customer Contract. Contractor shall notify Metro and the affected Customer of such abnormal leakage.	CEPS reports that it has access to all customer premises. Access has been tightened due to 9/11 security restrictions, however this has not prevented access, but rather delayed the process in only a minor and understandable way.
Service Interruptions	To the extent there are service interruptions for maintenance or safety or any reason whatsoever, the Contractor shall (i) notify all Customers as soon as it is aware of the interruption, (ii) use all reasonable efforts to minimize the duration of such interruption, and (iii) pay any amounts Metro becomes obligated to pay Customers in respect thereof in accordance with the terms of the Customer Contracts. The Contractor shall provide Customers to be affected by a planned service interruption with at least three (3) prior days' notice. To the extent consistent with Prudent Utility Practice, planned service interruptions shall be scheduled during periods of low energy demand.	This has reportedly been the case.
Periodic Reports	Within 30 days following each Contract Year, and two weeks prior to the annual meeting, the Contractor shall provide 12 copies of an annual report to Metro. At a minimum, the annual report shall contain: (i) an assessment of the condition of the System, (ii) details of	All of the required elements of this contractual requirement are included in the Annual Report. CEPS submits draft reports within 30 days following the contract year end, however some financial figures have

Category	Description	Comment
	modifications made to the System, (iii) analysis of the efficacy of all repairs, replacements and upgrades made during the applicable Contract Year, (iv) a summary of information provided in the monthly reports submitted during the applicable Contract Year, (v) a summary of environmental, safety and regulatory compliance, (vi) an outline and assessment of outstanding issues and any recommendations to Metro for changes to operations, (vii) plans for Fuel procurement, (viii) review of revenues charged and rebates made in the past year, (ix) plans for Additional Customers and (x) a summary of the operating budget.	prevented the submittal of the final report within this time frame.
Monthly Audit	Metro may (but shall not be required to) conduct, or cause to be conducted, at Metro's expense, monthly audit of the System. The audit may address operations, maintenance, environmental and safety performance, record keeping requirements, housekeeping, customer service, and any other issues relating to Contractor performance. The Contractor shall cooperate fully in such audits, and shall provide full access to facilities and records for the purpose of this audit. Upon receipt of written audit reports or comments, the Contractor shall provide timely responses to correct any deficiencies or address any concerns noted.	This is done by the contract administrator (TEG). This was done monthly until this month, and will now be performed quarterly, with the consent of Metro.
Monthly Report	On or before the 10th day of each month, the Contractor shall provide an operating report describing the operations during the immediately preceding month that shall contain the information required in **Appendix 11**. In addition, it shall address the Contractor's responses to deficiencies or issues addressed in Metro's monthly audit described in (B) above.	These have been generally issued on the 10th, however there have been occasions in which they have been issued on the 11th.
Records	The Contractor shall maintain documentation for all charges against Metro, the State and other Customers under this Contract and Metro's Customer Contract with the State.	The contractor meets these requirements. There has reportedly been no formal audit of the records by Metro since the contract

Category	Description	Comment
	The books, records, and documents of the Contractor, insofar as they relate to work performed or money received under this Contract, shall be maintained for a period of three (3) full years from the date of the final payment and shall be subject to audit at any reasonable time and upon reasonable notice by Metro, the State, the Comptroller of the Treasury, or their duly appointed representatives. The financial statements shall be prepared in accordance with generally accepted accounting principles.	commenced.
Marketing and Sales Service	The Contractor shall perform marketing and sales services as set forth in **Appendix 18**.	These activities are performed and are reported in the CEPS monthly report.

As can be seen from the table above, there have been no substantive contract violations by CEPS in operating the DES. The lone minor violation is in the failure to fax to Metro summaries of communications it has with customers. In fact, in GBB's report to Metro on FY06 operations, given August 29, 2006, page 14 of the report ("Fiscal Year 2006 District Energy System Report to Metro Council") indicates that there were no contract violations during FY06.

Determination: There have been no substantive violations of the contract by CEPS in operating the District Energy System. Further, the previous contract administrator overseeing this contract (GBB) appears to have fulfilled its contractual obligations as well. (The new contract administrator, Thermal Energy Group, has only recently begun serving as contract administrator. There is insufficient evidence at this point to make the determination as to whether TEG is fulfilling its contractual obligations, although the project team has no evidence to the contrary.) Although the project team found no substantive violations of the contracts, either by CEPS or GBB, it is recommended that Metro assume a more aggressive role in ensuring that the contract administrator complies with the terms of the contract. This should take the form of a monthly checklist of contractual items for which the Metro contract administrator obtains visual confirmation of compliance, or data to support a determination of compliance or non-compliance.

APPENDIX A

SUMMARY OF CUSTOMER SURVEY RESULTS FOR FY 2006 AND FY 2007

Results of DES Customer Survey-FY 2006

Total Number of Respondents: 6

Service: **Responses**

Chilled Water Service

	Yes	%	No	%
Satisfied with Service:	6	100%	0	0%
Placed a Service Call in last year	5	71%	2	29%
If so, was problem addressed	4	100%	0	0%

Comments: Meter problem-Line leak

Steam Service

	Yes	%	No	%
Satisfied with Service:	5	100%	0	0%
Placed a Service Call in last year	3	71%	2	29%
If so, was problem addressed	3	100%	0	0%

Comments: Condensate Trap Replacement

	(best ---------- worst)				
Rank	1	2	3	4	5
Confident that problems fixed in timely manner:	3	3	0	0	0
Service Dependable:	4	2	0	0	0
Percentage Average timely fix:	50%	50%	0%	0%	0%
Percentage Average dependable:	67%	33%	0%	0%	0%

Cost of Service

	Yes	No	Other
Getting a good price for service:	2	0	Average-Seems High-Gas too High
Understand billing structure:	3	1	0
Performed energy improvements	1	3	0

If so, what kind of improvements: Window seals-Calibration-Economizers

Newsletter	Yes	No	Other
Read Newsletter	6	0	0
Provides valuable information	5	0	Somewhat
Electronic format O.K	6	0	0

Information looked for in NL

Changes-Personnel-Tips-Human Interest-Ways to Conserve

Meetings	Yes	No	Other
Attend annual customer meeting	6	0	0
Meeting of value	6	0	0
Phone	Yes	No	Other
Ever called DES plant	5	1	0
Pleased with experience	5	0	0

If not, elaborate:

Website	Yes	No	Other
Visited website	4	2	0
Found it useful	3	0	Pay bill on line
What did you like	Ease of use- Details		
Times visited in last 12 mo.	1- 1	2 -3	3___ 4___ 5+ ____
What you would you like to see:	Tips-Innovations-Ways to Save		

General	Rank>>	(best ——— worst) 1	2	3	4	5
Communications		3	2	1	0	0
Satisfaction/Service		2	4	0	0	0
Satisfaction/Cost		0	2	3	0	1
Recommend DES		3	3	0	0	0

Other comments: Receive bill locally-Research gas prices

Results of DES Customer Survey-FY 2007

Total Number of Respondents: 7 Representing 20 Buildings

Service:	Responses			
Chilled Water Service	Yes	%	No	%
Satisfied with Service:	7	100%	0	0%
Placed a Service Call in last year	2	30%	5	70%
If so, was problem addressed	2	100%	0	0%

Comments: Service is good but too expensive.

Steam Service	Yes	%	No	%
Satisfied with Service:	6	100%	0	0%
Placed a Service Call in last year	1	16%	4	66%
If so, was problem addressed	0	0%	1	100%

Comments: Condensate Leak at Polk Building (Note: To be repaired in 2007 Capital Projects)

Rank	(best ---- 1	2	3	4	----worst) 5
Confident that problems fixed in timely manner:	3	4	0	0	0
Service Dependable:	5	2	0	0	0
Percentage Average timely fix:	43%	57%	0%	0%	0%
Percentage Average dependable:	71%	29%	0%	0%	0%

Cost of Service	Responses		
	Yes	No	Other
Getting a good price for service:	4 (57%)	2 (42%)	
Understand billing structure:	6 (86%)	1 (14%)	
Performed energy improvements	5 (71%)	2 (29%)	

If so, what kind of improvements? : Raised CHW temp. , Control Calibrations, Building Line Repairs, Energy Management Systems.

Newsletter	Yes	No	Other
Read Newsletter	4 (57%)	3 (43%)	
Provides valuable information	3 (43%)	0 (0%)	
Electronic format O.K	4 (57%)	0 (0%)	

Information looked for in NL: Fiscal & customer benefits, contacts, how to save energy costs.

Meetings	Yes	No	Other
Attend annual customer meeting	7 (100%)	0 (0%)	
Meeting of value	7 (100%)	0 (0%)	
Phone	Yes	No	Other
Ever called DES plant	6 (86%)	1 (14%)	
Pleased with experience	6 (86%)	0 (0%)	
If not, elaborate:			
Website	Yes	No	Other
Visited website	1(14%)	6 (86%)	
Found it useful	0	0	
What did you like?			
Times visited in last 12 mo.	1 (1) 2___	3___ 4___	5+ ___
What you would you like to see?	Tips on saving money (energy costs)		

General

	(best ----------worst)				
Rank....	1	2	3	4	5
Communications	2 (40%)	3 (60%)	0(0%)	0(0%)	0(0%)
Satisfaction/Service.....	4 (66%)	2 (44%)	0(0%)	0(0%)	0(0%)
Satisfaction/Cost	2 (29%)	1(14%)	1(14%)	2 (29%)	1(14%)
Recommend DES	3 (60%)	1(20%)	1(20%)	0 (0%)	0 (0%)

Comments: Cost is too expensive; re-evaluate capacity charges; response to questions on bill to slow.

APPENDIX B

SAMPLE CUSTOMER INVOICE

Metro Nashville
DISTRICT ENERGY SYSTEM
Visit us online at http://www.nashville.gov/des

90 Peabody Street
Nashville, TN 37210

OFFICIAL INVOICE

Bill to: Nashville Public Library
Chase Adams
615 Church Street
Nashville, TN 37219
Chase.Adams@nashville.gov

Nashville Public Library

Billing Information		
Customer Account Number:		0_5
Invoice Number:		20070115-045
Invoice Date:		01/15/2007
Billing Period:	12/01/2006	12/31/2006
Amount Due:		$33,709.72
Due on or before: 02/14/2007		

Chilled Water Billing Details	Current Period	Prior Year
Contract Chilled Water Capacity:	700 ton	700 ton
Billed Chilled Water Capacity:	0 ton	ton
Beginning Meter Reading:	2,519,891 ton-hr	
Ending Meter Reading:	2,661,276 ton-hr	
Chilled Water Use:	141,385 ton-hr	176,144 ton-hr
Fiscal Year To Date Use:	0 ton-hr	

Steam Billing Details	Current Period	Prior Year
Contract Steam Capacity:	8,374 pph	8,374 pph
Billed Steam Capacity:	0 pph	pph
Beginning Meter Reading:	17,163,782 lbs	
Ending Meter Reading:	18,083,512 lbs	
Steam Use:	919,730 lbs	1,738,902 lbs
Fiscal Year To Date Use:	0 lbs	

CUSTOMER CHARGES FOR CHILLED WATER SERVICE								AMOUNT
Capacity Charge								$ 3,845.33
	Contract Capacity Charge	700	tons	x	$5.4933	per ton	= $ 3,845.33	
	Fixed Operating Charge	700	tons	x	$0.0000	per ton	= $ 0.00	
	EDS Improvement Charge	700	tons	x	$0.0000	per ton	= $ 0.00	
	Metro Incremental Admin. Charge	700	tons	x	$0.0000	per ton	= $ 0.00	
Pass Through Charges								$ 1,577.49
	Water and Sewer	131,335	ton-hrs	x	$0.0086	per ton-hr	= $ 1,151.24	
	Chemicals	131,335	ton-hrs	x	$0.0058	per ton-hr	= $ 771.02	
	Engineering	700	tons	x	$0.1104	per ton	= $ 76.24	
	Insurance	700	tons	x	$0.0000	per ton	= $ 0.00	
	EDS Electricity	700	tons	x	$0.0000	per ton	= $ 0.00	
	EDS Maintenance Cost Allocation	700	tons	x	$0.0000	per ton	= $ 0.00	
Energy Charges								$ 8,997.39
	Electric	131,335	ton-hrs	x	$0.0685	per ton-hr	= $ 8,997.39	
TOTAL CHILLED WATER CHARGES		131,335	ton-hrs	x	$0.109/9715	per ton-hr	=	$ 14,420.21
CUSTOMER CHARGES FOR STEAM SERVICE								AMOUNT
Capacity Charge								$ 1,648.00
	Contract Capacity Charge	8,374	pph	x	$0.1967	per pph	= $ 1,646.66	
	Fixed Operating Charge	8,374	pph	x	$0.0000	per pph	= $ 0.00	
	EDS Improvement Charge	8,374	pph	x	$0.0000	per pph	= $ 0.00	
	Metro Incremental Admin. Charge	8,374	pph	x	$0.0000	per pph	= $ 0.00	
Pass Through Charges								$ 341.84
	Water and Sewer	919,780	lbs	x	$0.0002	per lb	= $ 219.72	
	Chemicals	919,780	lbs	x	$0.0000	per lb	= $ 88.42	
	Engineering	8,374	pph	x	$0.0126	per pph	= $ 33.69	
	Insurance	8,374	pph	x	$0.0000	per pph	= $ 0.00	
	EDS Electricity	8,374	pph	x	$0.0000	per pph	= $ 0.00	
	EDS Maintenance Cost Allocation	8,374	pph	x	$0.0000	per pph	= $ 0.00	
Energy Charges								$ 17,299.67
	Electric	919,780	lbs	x	$0.0002	per lb	= $ 233.64	
	Natural Gas	919,780	lbs	x	$0.0183	per lb	= $ 16,917.81	
	Propane	919,780	lbs	x	$0.0001	per lb	= $ 148.22	
TOTAL STEAM CHARGES		919,780	lbs	x	$0.02097157	per lb	=	$ 19,289.51
TOTAL SERVICE CHARGES for Billing Period								$ 33,709.72
								$
								$
								$
	SUBTOTAL							$ 33,709.72
TOTAL CHARGES for Billing Period								$ 33,709.72
	Previous Balance							$ 35,978.54
	Payments Received through: 01/12/2007							$ 35,978.54
CURRENT AMOUNT TO BE PAID								$ 33,709.72

****** Payments received after the due date will be assessed a late charge of 1 1/2% per month on the amount past due. ******

Please direct any billing inquiries to Jimmy Hatcher at (615) 742-1983 ext. 29 For customer service, please contact Chuck Tucker at (615) 742-1482 ext. 28

For Payments by Fed Wire Transfer:
SunTrust Bank
ABA Number: 061-000-104
Credit Account: Trust Division Account # 9103006200
Attn: Lee Ann Pinger (615) 748-5834
Reference: Metro DES #3613918
Fax an invoice copy to the Bank at (615) 748-3301

For Payments by Mail:
SunTrust Bank
Corporate Trust
201 Fourth Ave. 4th Floor Suite 430
Nashville, TN 37219

For Payment by Overnight Delivery:
SunTrust Bank
Attn: Lee Ann Pinger (TN-1430)
201 Fourth Avenue North, 8th Floor
Nashville, TN 37219

Make checks payable to: "Metropolitan Government of Nashville and Davidson County"

APPENDIX C

SAMPLE CUSTOMER MONTHLY INVOICE SUMMARY

Customer Invoice Data

Metro DES

CUSTOMER INFORMATION For August 2006				CUSTOMER INVOICE SUMMARY (BY TYPE)												
Customer Number	Customer Type	Invoice Type	Customer Name	Total Steam ($)	Total Steam Unit Cost ($/lb)	Total CHW ($)	Total CHW Unit Cost ($/tonhr)	Energy Charges for Billing Period ($)	Other Charges and Adjustments ($)	Sales Tax ($)	Late Charges ($)	Total Charges for Billing Period ($)	Previous Balance ($)	Payments Received ($)	Current Balance ($)	Invoice Number
002	3	1	A. A. Birch	36,380.28	0.037585	49,070.02	0.1053093	85,450.30	0.00	0.00	0.00	85,450.30	2,303.30	2,303.30	85,450.30	20060915-002
004	3	1	Metro Courthouse	6,733.77	103.59646	6,802.44	0.8939992	13,536.21	0.00	0.00	0.00	13,536.21	978.12	978.12	13,536.21	20060915-004
007	1	1	Parkway Towers	4,530.28	3.5671496	20,632.18	0.1293646	25,162.46	0.00	1,761.37	0.00	26,923.83	1,256.92	0.00	28,180.75	20060915-007
009	1	1	South Trust	4,481.88	0.0428585	9,152.56	0.1231441	13,634.44	0.00	954.41	441.29	15,030.14	29,948.63	0.00	44,978.77	20060915-009
010	1	1	Regions Bank	1,993.98	0	12,642.66	0.1158591	14,636.64	0.00	1,024.56	0.00	15,661.20	652.90	0.00	16,314.10	20060915-010
011	1	1	Sheraton Hotel	27,286.12	0.0439790	40,299.82	0.1159787	67,585.94	0.00	4,731.02	0.00	72,316.96	73,695.85	71,453.81	74,559.00	20060915-011
012	3	1	Municipal Auditorium	4,327.85	0	15,079.35	0.2288634	19,407.20	0.00	0.00	0.00	19,407.20	1,158.19	1,158.19	19,407.20	20060915-012
021	1	1	Hermitage Hotel	9,473.59	0.0845751	15,551.24	0.1229289	25,024.83	0.00	1,751.74	0.00	26,776.57	27,953.14	26,820.42	27,909.29	20060915-021
024	3	1	Criminal Justice Center	22,514.47	0.0581557	29,537.52	0.1264081	52,051.99	0.00	0.00	0.00	52,051.99	2,048.96	2,048.96	52,051.99	20060915-024
025	1	1	501 Union Association	2,460.84	0	7,216.98	0.1187785	9,677.82	0.00	677.45	163.44	10,518.71	11,323.28	0.00	21,841.99	20060915-025
028	5	3	Sun Trust Bank	6,896.20	0	34,705.71	0.1024741	41,601.91	0.00	2,912.13	671.61	45,185.65	43,425.05	0.00	88,610.70	20060915-028
029	1	1	Sun Trust Financial Center	0.00	0	38,594.39	0.1303349	38,594.39	0.00	2,701.61	0.00	41,296.00	45,031.43	42,639.46	43,687.97	20060915-029
032	1	1	Renaissance Hotel	33,726.83	0.0480812	49,013.76	0.1051297	82,740.59	0.00	5,791.84	0.00	88,532.43	2,656.66	0.00	91,189.09	20060915-032
033	3	1	Convention Center	22,640.61	0.1173016	48,356.16	0.1353127	70,996.77	0.00	0.00	0.00	70,996.77	3,165.60	3,165.60	70,996.77	20060915-033
034	1	1	Renaissance Office Tower	0.00	0	12,196.49	0.1063876	12,196.49	0.00	853.75	0.00	13,050.24	593.57	593.57	13,050.24	20060915-034
035	1	4	St. Mary of the Seven Sorr	330.95	0	503.14	0.2298492	834.09	0.00	0.00	0.00	834.09	834.09	834.09	834.09	20060915-035
036	1	1	Nashville City Center	0.00	0	41,670.05	0.1170283	41,670.05	0.00	2,916.90	0.00	44,586.95	45,987.87	43,670.10	46,904.72	20060915-036
038	1	1	Wildhorse Saloon	3,208.38	0.0471294	10,844.99	0.0965983	14,053.37	0.00	983.74	214.84	15,251.95	14,750.22	0.00	30,002.17	20060915-038
039	1	1	Ryman Auditorium	7,931.88	0.0271628	11,566.02	0.0910072	19,497.90	0.00	1,364.85	325.25	21,188.00	22,061.50	0.00	43,249.50	20060915-039
040	3	1	Gaylord Entertainment Cen	58,599.18	0.0318566	92,244.55	0.126487	150,843.73	0.00	0.00	2,106.09	152,949.82	147,694.04	142,371.24	158,272.62	20060915-040
041	3	1	Nashville Coliseum	0.00	0	69,433.45	0.1345651	69,433.45	0.00	0.00	0.00	69,433.45	3,558.71	0.00	72,992.16	20060915-041
043	3	1	Hume Fogg School	10,122.02	0.0333915	11,237.42	0.1247050	21,359.44	0.00	0.00	0.00	21,359.44	599.91	599.91	21,359.44	20060915-043
044	5	3	Nashville Symphony	39,200.21	0.026224	29,766.97	0.0912901	68,967.18	0.00	0.00	0.00	68,967.18	62,748.70	63,781.39	67,934.49	20060915-044
045	5	3	Nashville Public Library	25,858.73	0.0255392	26,625.84	0.0758506	52,484.57	0.00	0.00	0.00	52,484.57	-1,088.29	0.00	51,396.28	20060915-045
049	5	3	Viridian Residential Tower	0.00	0	16,871.54	0.2080594	16,871.54	0.00	1,181.01		18,052.55	26,200.27	0.00	44,252.82	20060915-049
S1	2	S	State Government of Tenn	181,279.27	0.0432758	324,440.75	0.1162145	505,720.02		0.00	0.00	505,720.02	491,353.44	492,577.86	504,495.60	20060915-S1
			Grand Totals:	509,977.32		1,024,056.00		1,534,033.32	0.00	29,606.38	3,922.52	1,567,562.22	1,060,892.06	894,996.02	1,733,458.26	