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# City of Denton
## Assessment of FY 2015 and FY 2016 EMO Savings

September 11, 2017

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# Introduction

## Scope

We are pleased to provide this report with respect to the cost savings assessment services performed in accordance with our statement of work dated July 26, 2017 by Deloitte & Touche LLP, as requested by the City of Denton. Deloitte & Touche LLP ("D&T") understands that on October 1, 2014, Denton Municipal Electric ("DME") implemented the Energy Management Organization ("EMO") to manage the utility's electric supply portfolio as well as to interface with Electric Reliability Council of Texas ("ERCOT") to perform all required scheduling, regulatory and settlement activities. A component of the decision to implement the EMO was the expectation of cost savings relative to the alternative of outsourcing the function to a 3rd party.

On February 2, 2017, DME held a joint meeting with the City of Denton Strategy Committee / Operating Committee to review the cost savings estimated for FY 2015 (October 1st 2014 – September 30th 2015) and FY 2016 (October 1st 2015 – September 30th 2016). While the reported net savings was budgeted at $2.3 million for FY 2015, the final net savings estimate for the 12-month period was $13.5 million. Similarly, the reported FY 2016 net savings budgeted at $5.24 million was eclipsed by the final net savings and an initial estimate of $12.9 million. The total net savings for both FY 2015 and FY 2016 was estimated to be a total of $26.4MM.

In order to assess and analyze the reported savings, the City of Denton has engaged D&T to perform a model validation and cost analysis of the EMO Cost Savings Model ("EMO Model") used for the FY 2015 and FY 2016 periods.

# Background

In 2002, prior to the creation of the EMO, the Texas electric market went through a deregulation process. Beginning in the post-deregulation markets, DME utilized services from several different energy companies to procure the power needed to meet end-user demand. In 2011, DME selected a single counterparty as an outsourced energy management provider to procure and deliver energy between FY 2011 until FY 2014. As the initial contract was set to expire, DME contemplated the creation of its own energy management organization to bring the function of power procurement and scheduling in-house. As part of this process and when the contract was up for renewal, DME requested a new quote from the same counterparty to extend the current contract through FY 2016. The quote or cost of power was provided in the form of a fixed heat rate multiplied by an index-based cost of natural gas to arrive at a cost of power. A heat rate is defined as the efficiency of power generation. The origin for the expression is the relative efficiency of the conversion of a fuel to electricity. It is the multiplier applied to natural gas to calculate the price of power for a particular period of time. A heat rate and efficiency have a natural inverse relationship. If there is an increase in plant efficiency, then the lower the heat rate. In other words, the lower the heat rate then the better your plant is running to be more competitive. Depending on the heat rate, it can either increase or decrease your profit margin of running your business.

In May 2014, DME received the quote from incumbent counterparty, based on a 15.75 (MMBtu/MWh) heat rate, for a 2-year contract for FY 2015 and FY 2016. For context, the heat rate quote that was provided to DME for services in FY 2011 till 2014 was 11.60.

As part of the decision to decline the extension of the heat rate contract, DME developed a cost savings model and identified estimates of potential savings for the City of Denton if it were to authorize and implement the EMO. The EMO Model contains two specific inputs: 1) Benchmark Cost and 2) EMO Cost. The Benchmark Cost is the estimated and assumed costs of continuing the outsourced energy management model based on a heat rate quote of 15.75 and ancillary services and qualified scheduling entity[1] ("QSE") service fees of approximately $5 per MWh. On the other hand, the EMO Cost represented the all-in cost of developing, implementing and operating the daily energy management services previously provided by the outsourced provider. The savings are the difference between the Benchmark Cost and the EMO Cost.

## Executive Summary

The scope of this engagement included D&T's assessment and validation of DME's EMO Model to include the data used in the model and the calculation of the Benchmark Cost and the EMO Cost (described in further detail below). The approach consisted of collecting DME documentation and data, and performing interviews with members of DME management and personnel to understand the inputs, exclusions and assumptions associated with the development, maintenance, and use of the EMO Model.

D&T's approach focused on three main areas:

1. Validating the model and re-performing the savings calculation
2. Analyzing the Benchmark Cost, and
3. Reviewing the EMO Cost estimate

### Model Validation and Savings Calculation Re-performance

Under the model validation and savings calculation re-performance, D&T reviewed the inputs and data used in the implementation of the EMO Model and compared them to independently gathered inputs such as historical daily forward pricing and settlement prices and re-performed the calculations for both the Benchmark and EMO Cost. Based on the re-calculation, D&T observed a difference in cost savings of ~$9,484 or ~0% for FY 2015 and a difference of $374,166 or ~2.91% for FY 2016. Please refer to Table 1 in the Model Validation and Savings Calculation Re-performance section for more detail.

### Benchmark Cost Analysis

One of the biggest factors in the calculation of the Benchmark Cost is the heat rate assumption used in the calculation of the cost of power. The larger the heat rate, the larger the cost of

[1] Qualified scheduling entities are responsible for interacting with ERCOT, submitting load bids in the day-ahead and real-time markets and are generally responsible for managing the day to day energy requirements of a load serving entity ("LSE"). QSE services could also include transacting in the forward markets, procuring ancillary services, making and executing operational decisions, and managing certain activities arising from the need to provide electricity to end-users.

power and Benchmark Cost, and all things equal, the larger the cost savings. As part of the analysis, D&T reviewed the benchmark heat rate quoted by the counterparty in May 2014 as well as DME's analysis on the reasonableness of the quote received. The quote provided by the counterparty was 15.75. Put into context, the average actual heat rate, for all hours of each day in the year leading up to May 2014, was 10.10. D&T analyzed that the quote provided by the counterparty was reasonable based on an analysis of market data assuming that DME was only interested in purchasing power during on-peak hours, or from 7AM to 11PM each day. However, since the counterparty would, in fact, be responsible for providing power for all hours of the day, including the overnight period, it is D&T's opinion that the more appropriate heat rate to use would be an Around-the-Clock ("ATC") heat rate. Additionally, rather than base the quote on a single data point, as the counterparty did in developing the 15.75 heat rate quote, it is more reasonable to look at a broad historical data set to derive a fair heat rate to use in the cost of power calculation.

D&T performed analysis that independently calculated the average heat rates using historical data ranging from May 2013 to April 2014 to derive an estimate of the market heat rate for the power to be purchased on the contract. Based on the analysis, D&T observed that the ATC heat rate was 10.10, as stated above. For the ease of the analysis, the 10.10 heat rate has been rounded to 10.25. In addition to the heat rate, it is typical to include a premium or profit margin to account for the risk the counterparty is assuming and to compensate them for the outsourced service they are providing. As part of DME's objective analysis of the counterparty's 15.75 heat rate quote, it was estimated that the premium/profit margin was approximately 2.36 heat rate adder. For the ease of the analysis, this was rounded to a 2.5 heat rate adder. Using the D&T heat rate analysis and the DME's premium estimate, D&T performed a sensitivity analysis on the impact of adjusting the heat rate used in the cost savings calculation. In our opinion, a 12.75 benchmark, 10.25 heat rate + 2.50 premium adder, could represent a fair (to both sides) representation of the cost of power and could result in a reduction of ~$13.4 million in the total net savings for FY 2015 and FY 2016. Thus the $26.4 million cost savings identified above and reported by DME could be reduced to approximately $13.0 million across the two years.

## EMO Cost Review

For the EMO cost review, D&T has reviewed the costs associated with running the EMO and has compared certain elements that are embedded in a typical commodity trading and risk management ("CTRM") program. We observed the data provided by DME and analyzed it to understand the breadth and depth of the costs considered by EMO to be core in a typical CTRM program. While the costs provided by DME and included in the cost model are reasonable, there are likely certain costs that are not being considered. In order to build greater confidence in the cost savings estimates, it is important to include costs, both direct and indirect, that arise from development, implementation, and ongoing operation of the EMO. For example, an important aspect of a CTRM program is the appropriate balance of segregation of duties among front (energy traders and marketers), middle (risk control and oversight), and back office (settlements and accounting) personnel. Our review of the organizational structure and the EMO personnel found that there could be an imbalance in the ratio of front to middle/back office resources. This could result in additional costs for the ongoing operation of the EMO. Based on D&T's review of the EMO Cost, we have provided additional cost considerations in the EMO Cost Review section below, as well as recommended next steps to consider.

## Recommended Next Steps

Based on D&T's analysis and assessment of the EMO Model, including the Benchmark Cost and the EMO Costs, we recommend the following next steps in order to develop a more complete understanding of the cost savings, the risk that may or may not have been introduced by the EMO, and the EMO's ability to effectively manage the risk.

1. FY 2017 benchmark analysis: Consider performing an analysis of alternative benchmark calculations to be used in the cost savings calculation. This should be undertaken prior to the calculation of the estimated FY 2017 cost savings.
2. Risk profile and hedge strategy assessment: Consider quantifying the market risk introduced by the decision move from an outsourced energy management model to an in-house management.
3. EMO risk assessment: Consider having an independent assessment of the EMO's risk oversight capabilities that are in place to support the EMO's mission and energy management activities, including any anticipated growth plans.

# EMO Model

For FY 2015 and FY 2016, the methodology for estimating the cost savings was determined to be the difference between the Benchmark Cost, as calculated under the prior outsourced arrangement but updated with the new heat rate quote, and the costs associated with development, implementation, and operation of the EMO. The reported savings are calculated using the formula below:

**Annual Estimated EMO Savings =** ∑ Monthly Benchmark Cost for each fiscal year
– ∑ Monthly EMO Cost for each fiscal year

The model used to estimate the savings is referred to as the EMO Model.

## Inputs

There are two sets of inputs used in the EMO Model: 1) Benchmark Cost and 2) EMO Cost

1) The Benchmark Cost is calculated using the following inputs:
   - Benchmark quoted heat rate price of 15.75 for each MWh delivered
   - Benchmark quoted QSE services price of $5.25 for each MWh of DME load
   - The PLATTS Gas Daily natural gas price for each day in the fiscal year
   - ERCOT Real Time ("RT") 15 minute clearing prices
   - DME load served (as reported to ERCOT)
   - DME purchased supply from power purchase agreement (PPA) (as reported by ERCOT)

2) The EMO Cost is calculated using the following inputs:
   - EMO general and administrative costs, including:
     - Personnel costs
     - Physical plant depreciated expense

  - Software and Hardware depreciated expense
  - Supplies and Services
- Energy and QSE Services costs, including:
  - Energy from bilateral transactions with over-the-counter counterparties
  - Broker fees
  - Financial power transactions
  - Financial natural gas transactions
  - ERCOT daily charges and credits
  - ERCOT monthly, quarterly, and semi-annual fees and charges
  - Congestion Revenue Right ("CRR") auction costs

## Exclusions

The EMO cost savings model exclusions are:
1) ERCOT CRRs,
2) Select counterparties costs,
3) Renewable Energy Credits ("RECs"), and
4) Denton Power Energy Landfill costs

The exclusions listed above have been selectively omitted from the comparison since they were borne by DME prior to the development and implementation of EMO operations and have been paid continuously by DME regardless of the implementation of the EMO and the services and power provided by DME's counterparty.

## Assumptions

The EMO cost savings model assumptions include:
1) The 15.75 heat rate was a reasonable, competitive market quote as provided by a willing market participant, and
2) The ancillary services[2] growth rate is 5% each year. The ancillary services provided in previous years had an average growth rate of ~5% per year.

## Calculations

### Benchmark Cost

For the period prior to the creation of the EMO, DME received a monthly invoice from the counterparty for energy services provided. The invoice was in the form of a Microsoft Excel spreadsheet, which contained all the inputs listed above in the Benchmark Cost Input section. Post-EMO creation, DME utilized the same spreadsheet format and formulas to mimic the cost

[2] Ancillary services are additional costs required to support the generation and delivery of electricity to end-users. Ancillary services are a function of the need to actively manage the generation, distribution and transmission system to ensure safe and reliable delivery of electricity to end-users. They are necessary to support the transmission of electric power from sellers to purchasers, given the obligations of control areas and transmitting utilities within those control areas, to maintain reliable operations of the interconnected transmission system. Ancillary services supplied with generation include load following, reactive power-voltage regulation, system protective services, loss compensation service, system control, load dispatch services, and energy imbalance services. **Source**: Federal Energy Regulatory Commission ("FERC")

calculations and establish Benchmark Cost as if an extension to the original contract was executed.

### *Incremental Energy*

The DME Load, Gibbons Creek Generation, Wolf Ridge Generation would be provided as reported by ERCOT. Using these inputs provided by ERCOT, the EMO could calculate the incremental energy. The calculation is as followed:

***Incremental Energy =*** DME Load - Gibbons Creek Generation - Wolf Ridge Generation

### *Floating Fuel Cost*

Once the incremental energy is calculated, the floating fuel cost be calculated using the floating fuel index, Houston Ship Channel, and the quoted heat rate. The calculation is as follows:

***Floating Fuel Cost =*** Incremental Energy X Floating Fuel Index ($/MMBtu) X 15.75 Heat Rate

### *Gibbons Creek Delivery Charge*

To calculate the Gibbon Creek Delivery charge, EMO downloaded the Gibbons Creek Generation, the North Load Zone Settlement Point Price (SPP) and the Gibbons Creek SPP from ERCOT. The calculation is as follows:

***Gibbons Creek Delivery Charge =*** Gibbons Creek Generation x (North Load Zone SPP - Gibbons Creek SPP)

### *Excess Generation Credit*

To calculate the Excess Generation Credit, EMO downloaded the DME Load, Gibbons Creek Generation, Wolf Ridge Generation, and Gibbons Creek (Settlement Point Price) from ERCOT. The calculation is as follows:

***Excess Generation Credit =*** (Gibbons Creek Generation + Wolf Ridge Generation - DME Load) x Gibbons Creek SPP

### *Ancillary Services & QSE Cost*

To calculate the ancillary services and QSE services, EMO used the DME load multiplied by the ancillary services factor of $5.25/MWh (FY 2015) and $5.51/MWh (FY 2016). The calculation is as follows:

***Ancillary Services and QSE Cost =*** DME Load X $5.25/MWh (FY 2015) or $5.51/MWh (FY 2016)

### *Benchmark Cost*

To calculate the Benchmark Cost, see calculation:

***Benchmark Cost*** **=** Floating Fuel Cost + Gibbons Creek Delivery Charge + Excess Generation Credit + Ancillary Services and QSE Cost

## EMO Cost

DME established the EMO under the assumption that the management of the energy portfolio, providing supply, scheduling, hedging and transacting in the forward markets, interfacing with ERCOT, and all required regulatory and settlement activities could be provided at a significantly lower cost when compared to the services provided by other outsourced energy management providers.

The EMO Cost for the first year of operation was calculated on a monthly basis within a Microsoft Excel workbook named "Shadow PL Components" and the final estimated savings calculations and reports were maintained in the same workbook. The inputs as well as the source origins are listed below:

- Counterparty Energy Invoice amounts
  Source: Received Invoices
- ERCOT CARD (CRR Auction Revenue Distribution) Invoices
  - Source: ERCOT Invoice Amounts recorded in Settlement Calendar workbook
- ERCOT CBA (CRR Balancing Account) Invoices
  - Source: ERCOT Invoice Amounts recorded in Settlement Calendar workbook
- TOTAL ESTIMATED EMO EXPENSES:
  - Source: JD Edwards Accounting system via Electric Administration Business Manager
- ERCOT DAM (Day Ahead Market) Statements
  - Source: ERCOT Statement Totals recorded in Settlement Calendar workbook
- ERCOT RTM (Real Time Market) Statements
  - Source: ERCOT Statement Totals recorded in Settlement Calendar workbook
- ERCOT CRR Auction Costs
  - Source: ERCOT Auction award volume and price data as stored in database
- ERCOT CRR Statements
  - Source: Query for ERCOT DAM charges and credits applicable to all CRR paths except those from Gibbons Creek which are excluded as an expense incurred by DME prior to the EMO, as stored in Settlement Data Extract database
- Broker Fees
  - Source: Broker Invoices
- ADMIS Bilateral

- Source: ADMIS reported Cash Flows as recorded in the Settlement Calendar workbook (Tab "ADMIS Journal New")

### EMO Model Cost Savings Calculations

In order to estimate the savings arising from in-sourcing the energy management operations, the monthly FY 2015 and FY 2016 Benchmark Cost and EMO Cost were aggregated and used in the formula below to estimate the annual savings. The files containing the calculations are named: Shadow PL components 2015.xlsx and Shadow PL components 2016.xlsx. The calculations are as follows:

**Annual Estimated EMO Savings =** $\sum$ Monthly Benchmark Cost for each fiscal year − $\sum$ Monthly EMO Cost for each fiscal year

# D&T Approach

## Procedures performed

### Model Validation and Savings Calculation Re-performance

D&T met with DME on June 14, 2017 to develop an understanding of the EMO Model. D&T requested several different iterations of DME documentation and data pertaining to FY 2015 and FY 2016 cost savings calculations, as well as performed follow-up interviews with DME personnel since the initial meeting. For some data elements, D&T was able to independently pull data that was publicly available, including some elements of the market price data required for the calculation of the cost savings. For certain data elements, D&T observed DME personnel pull information directly from the appropriate sources, such as ERCOT, in order to provide D&T with data that could not be independently obtained.

Once the available information was collected, D&T independently inspected the calculation logic built into the Excel workbooks provided by DME. Additionally, the various formulas were reviewed and aligned with D&T's understanding and expectations of how the model should be executed.

For the Benchmark Cost, D&T developed a workbook to analyze the EMO calculated monthly costs which were included in the shadow invoice created by the EMO staff. For months that contained discrepancies, D&T identified the root cause for the deviation from the costs as presented in DME's EMO Model.

For the EMO Cost, D&T compiled an inventory of the costs using the files (Shadow PL components 2015.xlsx and Shadow PL components 2016.xlsx) provided by the EMO. D&T requested documents, data and other information to support re-performance of the EMO Cost contained within those two files. Once the files were provided to D&T, we inventoried and cross-examined the EMO Cost that were reported in the Excel files for the respective fiscal year and month with the data independently obtained. Each document obtained was inventoried as it was received and was categorized with the appropriate input type (i.e. bilateral energy contracts, CRR auction costs, day-ahead energy costs), fiscal year and month. Once D&T received a full inventory of the documents, data and information requested, D&T reviewed discrepancies with the EMO and documented the root cause for the discrepancy.

Based upon the documents, data, information, and documented discrepancies, D&T compared the independent Benchmark Cost, the EMO Cost and the savings with the DME calculated values for FY 2015 and FY 2016 in Exhibit 1 below.

**Exhibit 1: Summary of Model Validation and Savings Calculation Re-performance**

| | FY 2015<br>Oct 2014 – Sept 2015 | FY 2016<br>Oct 2015 – Sept 2016 |
|---|---|---|
| Benchmark Cost (as calculated by D&T*) | $46,878,558 | $40,032,681 |
| Benchmark Cost (as calculated by DME) | $46,888,317 | $39,703,505 |
| **Difference** | **$(9,759)** | **$329,176** |
| | | |
| EMO Cost (as calculated by D&T*) | $(33,400,290) | $(26,793,032) |
| EMO Cost (as calculated by DME) | $(33,419,533) | $(26,838,022) |
| **Difference** | **$19,243** | **$44,990** |
| | | |
| Savings (as calculated by D&T*) | $13,478,268 | $13,239,649 |
| Savings (as calculated by DME) | $13,468,784 | $12,865,483 |
| **Difference in cost savings** | **$9,484** | **$374,166** |
| **DME vs Independent Savings %** | **~0%** | **~2.91%** |

Source: D&T recalculation of DME cost savings

Some of the contributing factors to the differences identified above include, but are not limited to:

1) July and Sept 2016 loads as reported in the model were different than the source data observed.
2) The Oct 2015 ancillary services input cost was inconsistent with other months in the model.
3) Other differences included auction costs, Day-Ahead Market (DAM) CRR statements, and DA/Real-Time Market (RTM) ERCOT statements.

For the individual monthly detail, see tables in the **Section 5 Appendix**.

- Exhibit 7: DME Reported FY 15 Cost Savings
- Exhibit 8: DME Reported FY 16 Cost Savings
- Exhibit 9: Independent FY 15 Cost Savings
- Exhibit 10: Independent FY 16 Cost Savings

- Exhibit 11: Differences between Exhibit 7 and 9 (FY 2015)
- Exhibit 12: Differences between Table 8 and 10 (FY2016)

## Benchmark Cost Analysis and Assessment

### *Heat Rate Analysis*

As discussed above, a critical and sensitive component of the cost savings calculation is the heat rate assumption used in the calculation of the Floating Fuel Cost. The higher the heat rate quoted by the counterparty, the higher the Benchmark Cost and all things equal, the higher the cost savings calculated in the EMO Model. The heat rate is the measure of efficiency in the creation of electricity. It is calculated by dividing the price of power (to be delivered in some future period) by the price of natural gas (to be purchased in the same future period). The higher the heat rate, the less efficient the power generation is and thus the more costly the power. The lower the heat rate, the more efficient power generation is and thus the less costly the power. Therefore, it is important to understand context, analysis and market conditions that factor into the determination of a reasonable heat rate to be used in the cost savings calculation. Some typical considerations include:

- The time frame and availability of data used in the analysis of the appropriate heat rate
- The time period during which the power will be provided – on-peak, off-peak, and around-the-clock ("ATC"), and
- The reasonable premium or profit margin commensurate with the risk being assumed by the counterparty providing the power to DME

Given the sensitivity of the cost savings to the heat, D&T performed an analysis of historical implied heat rates in order to assess the appropriateness of the 15.75 heat rate quoted by the counterparty and used by DME for the Benchmark Cost calculation. D&T's analysis was performed based upon quoted forward contract prices provided by an independent third party. A forward contract represents the price that a third party would be willing to sell (or buy) power from another third party for some period of time in the future. These contracts are typically called bilateral contracts between two counterparties. The analysis was performed for all forward contract months from February 2013 until January 2019 and for all market dates from January 1, 2013 until August 8, 2017. The data used in the analysis included ERCOT North ATC and on-peak prices and Houston Ship Channel ("HSC") natural gas forward prices. Exhibit 2 and Exhibit 3 below compare the monthly average calculated heat rate for on-peak and ATC periods, respectively. Note the historical averages do not contain the premium/profit margin included by the counterparty in the heat rate (15.75) used in the Benchmark Cost calculation. Exhibit 13 and Exhibit 14 located in the Appendix provide the detailed monthly averages used to populate the graph.

**Exhibit 2: On-Peak Heat Rate Analysis**

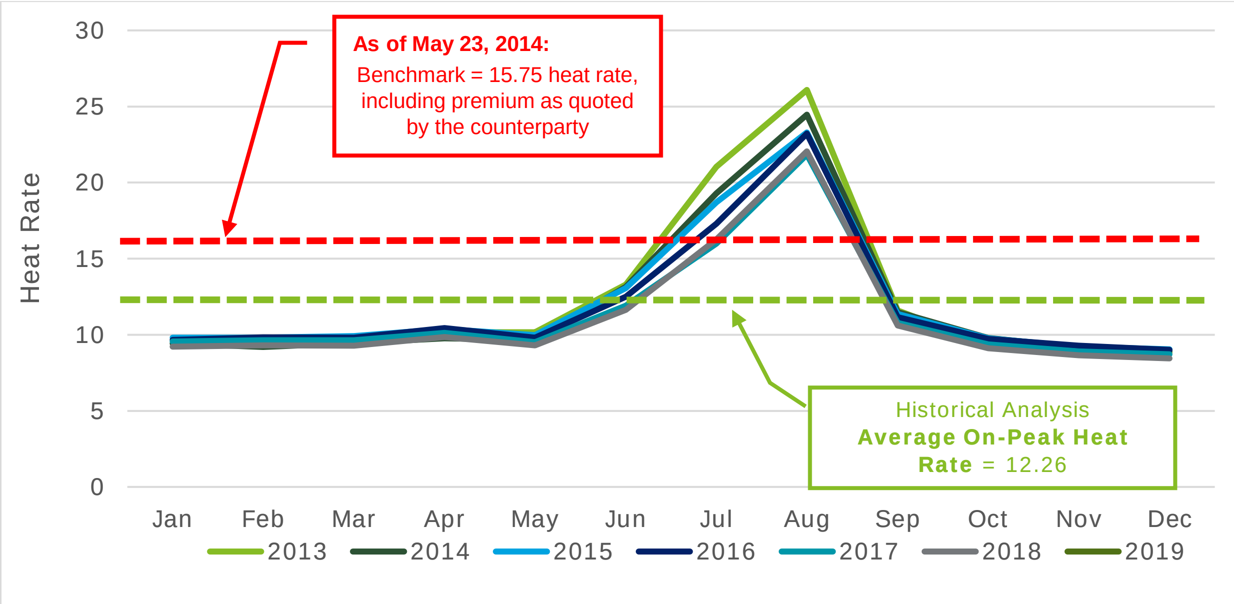
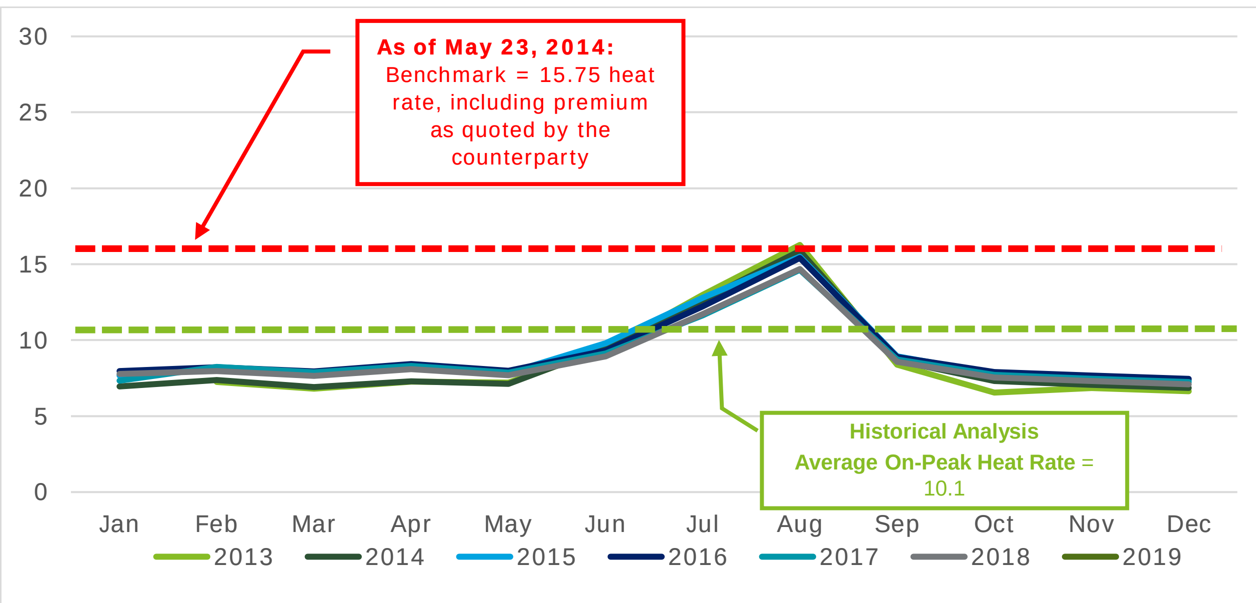



**Exhibit 3: Around-the-Clock Heat Rate Analysis**




## Observations

- The heat rate provided by the counterparty in May 2014 was reasonable for an on-peak heat rate for the particular date on which it was provided; however, it may not be a reasonable representation for the power to be procured by DME from the counterparty since DME would be procuring around-the-clock ("ATC") power for every hour of the day. If DME only needed to procure power for hours 7AM to 11PM, then an on-peak heat rate would be more appropriate.

- The average heat rate using historical contract data for months May 2013 through April 2014 is 12.26 for an on-peak and 10.10 for an ATC heat rate.
- When you extend the historical analysis for a longer period, with data available through the time of this analysis, the overall average on-peak heat rate, estimated at 11.77, is slightly lower than the one-year analysis D&T performed. The corresponding heat rate for ATC power is estimated at 9.65, again lower than in the one-year analysis performed.
- Even when controlling for the fact that the 15.75 heat rate includes a premium/profit margin and the heat rate analysis shown above does not, there is an observable difference when comparing the 15.75 to the average ATC heat rate.

Because of the observations noted above, D&T performed an analysis to assess the sensitivity of the cost savings in the EMO Model with varying heat rate assumptions while holding other variables constant. The purpose of this analysis was to demonstrate how changes in the heat rate assumption, both small and large changes, could impact the amount of savings reported by DME. Exhibit 4 below details the change in the total cost savings, for FY 2015 and 2016 combined, under different heat rate and premium/profit margin assumptions.

**Exhibit 4: Adjusted Cost Savings for FY 2015 and FY 2016 under different heat rate assumptions**

| FY 2015 | | | | | |
|---|---|---|---|---|---|
| Heat Rate | Premium | Benchmark | Reduction in cost savings | Adjusted Cost Savings[3] | Budgeted Cost Savings |
| 13.25 | 2.5 | 15.75 | N/A | N/A | $2,300,000 |
| 12.25 | 2.5 | 14.75 | ($2,449,176) | $11,019,608 | |
| 11.75 | 2.5 | 14.25 | ($3,673,763) | $9,795,021 | |
| 11.25 | 2.5 | 13.75 | ($4,898,351) | $8,570,433 | |
| 10.75 | 2.5 | 13.25 | ($6,122,938) | $7,345,846 | |
| 10.25 | 2.5 | 12.75 | ($7,347,526) | $6,121,258 | |
| 9.75 | 2.5 | 12.25 | ($8,572,113) | $4,896,671 | |
| 9.25 | 2.5 | 11.75 | ($9,796,701) | $3,672,083 | |
| **FY 2016** | | | | | |
| **Heat Rate** | **Premium** | **Benchmark** | **Reduction in cost savings** | **Adjusted Cost Savings[4]** | **Budgeted Cost Savings** |
| 13.25 | 2.5 | 15.75 | N/A | N/A | $5,240,000 |
| 12.25 | 2.5 | 14.75 | ($2,008,451) | $10,857,032 | |
| 11.75 | 2.5 | 14.25 | ($3,012,677) | $9,852,806 | |
| 11.25 | 2.5 | 13.75 | ($4,016,902) | $8,848,581 | |
| 10.75 | 2.5 | 13.25 | ($5,021,128) | $7,844,355 | |
| 10.25 | 2.5 | 12.75 | ($6,025,354) | $6,840,129 | |
| 9.75 | 2.5 | 12.25 | ($7,029,579) | $5,835,904 | |
| 9.25 | 2.5 | 11.75 | ($8,033,805) | $4,831,678 | |

**Note:** In order to calculate the cost savings reduction and the adjusted cost savings, the heat rate was the only adjustment made to the Benchmark Cost in the EMO Model holding all other variables constant, including the ancillary services. A separate analysis was conduct on the benchmark ancillary services to the actual costs in the section below.

When examining the exhibit above, a benchmark of 12.75 (10.25 heat rate + 2.50 premium) results in ~$7.3 million and ~$6.0 million for FY 2015 and FY 2016, respectively, reduction in the cost savings reported by DME. Adjusting the heat rate assumption used in the model results in an adjusted cost savings of ~$6.1 million for FY 2015 and ~$6.8 million for FY 2016. As is demonstrated in the exhibit above, there is a significant reduction in the cost savings when the heat rate is adjusted to a heat rate informed by historical analysis for FY 2015 and FY 2016.

While the analysis above demonstrates that the approach to how the heat rate is constructed can have a large impact on the cost savings reported, it does not consider that there may be alternative benchmarks that could be used in the cost savings calculation. Therefore as a next step, D&T recommends that an analysis of alternative benchmark calculations be

[3] The Adjusted Cost Savings is calculated by applying the adjusted heat rate to the Benchmark Cost to the Cost Savings calculated by DME ($13,468,784) as presented in Exhibit 1.
[4] The Adjusted Cost Savings is calculated by applying the adjusted heat rate to the Benchmark Cost to the Cost Savings calculated by DME ($12,865,483) as presented in Exhibit 1.

completed prior to the calculation of the estimated FY 2017 cost savings calculation. DME has developed and analyzed several different approaches to calculate the benchmark cost for FY 2017 and have identified a preference going forward. However, prior to the final determination of the benchmark, an independent analysis should be conducted to assess whether DME's preferred option or an alternative approach is the more appropriate benchmark to use in the EMO Model for FY2017 and future periods.

### *Ancillary Service and Qualified Scheduling Entity Cost Analysis*

D&T also examined other potential areas that may help contribute to a better understanding of the main drivers of the cost savings. As demonstrated above, we observed that the heat rate can impact the savings substantially. The same is also true when examining the ancillary services and qualified scheduling entity ("QSE") costs as quoted by the counterparty and compared to the actual ancillary service and QSE costs incurred by DME. As described earlier in this report, ancillary service costs are costs incurred to help safeguard, balance, and manage the electricity transmission and distribution system as electricity flows from the generating sources to end users. QSE costs are costs incurred interacting with ERCOT and managing the activities required to supply electricity to end-users.

As part of the analysis, we compared the ancillary service and QSE costs quoted by the counterparty, $5.25/MWh (FY 2015) with an assumed 5% growth rate to derive the $5.51/MWh (FY 2016), to the actual costs incurred by DME. DME included the following costs in the QSE cost category:

- EMO general and administrative costs, including:
    - Personnel costs
    - Physical plant depreciated expense
    - Software and Hardware depreciated expense
    - Supplies and Services
- Energy and QSE Services costs, including:
    - Energy from bilateral transactions with over-the-counter counterparties
    - Broker fees
    - Financial power transactions
    - Financial natural gas transactions
    - ERCOT daily charges and credits
    - ERCOT monthly, quarterly, and semi-annual fees and charges
    - Congestion Revenue Right ("CRR") auction costs

Based on this analysis, we can observe that the ancillary services and QSE costs calculated based on the counterparty quote are significantly higher than the actual costs incurred by DME. Exhibit 5 shows a summary of the ancillary service cost analysis.

**Exhibit 5: Comparison of Ancillary Services and QSE Costs (A/S)**

| | FY 2015 | | | FY 2016 | | |
|---|---|---|---|---|---|---|
| | Benchmark | Actual Costs | Cost Savings | Benchmark | Actual Costs | Cost Savings |
| EMO Cost | $7,977,720 | $4,740,205 | $3,237,514 | $8,199,242 | $4,701,112 | $3,498,130 |

When examining Exhibit 5 above, the estimated ancillary service cost under the counterparty proposal (Estimated Benchmark) would have been approximately ~$8 million and ~$8.2 million for FY 2015 and FY 2016 respectively. When compared to the actual EMO Costs for each year, this explains ~$3 million and ~$3.5 million of the reported cost savings reported by DME for FY 2015 and FY 2016 respectively.

While there is not a liquid forward market for ancillary services that could allow a similar analysis that was performed for the heat rate analysis, it does help identify where a substantial portion of the cost savings arise from. As a result of the absence of a liquid forward market, D&T does not recommend additional analysis or assessment of the ancillary service costs.

### *Benchmark Cost Analysis and Assessment Conclusion*

As demonstrated by the heat rate and ancillary service analysis above, there are is some subjectivity in the assumptions used to calculate the cost of electricity (heat rate analysis) and the cost for managing and delivering the electricity (ancillary service analysis). When these two analysis are taken together, the cost savings can be described in the following manner:

**Exhibit 6: Summary of heat rate and ancillary service analysis' impact on the estimated cost savings**

| | FY 2015 | FY2016 |
|---|---|---|
| Budgeted cost savings | $2,300,000 | $5,240,000 |
| DME calculated cost savings | $13,468,784 | $12,865,483 |
| Heat rate benchmark adjustment | ($7,347,526) | ($6,025,354) |
| Adjusted cost savings | $6,121,258 | $6,840,129 |
| Portion of cost savings attributable to heat rate | 54.5% | 46.8% |
| | | |
| Adjusted cost savings | $6,121,258 | $6,840,129 |
| Estimated ancillary services ("A/S") cost savings | $3,237,514 | $3,498,130 |
| Portion of ***adjusted*** cost savings attributable to A/S | 52.8% | 51.1% |

As can be seen in Exhibit 6 above approximately half of the cost savings can be explained by a heat rate benchmark that is not supported by historical analysis. When the benchmark is adjusted as described earlier in this report, the cost savings are reduced by approximately 54% and 47% for FY 2015 and FY 2016 respectively. Additionally, when you consider that the ancillary service cost quoted by the counterparty is significantly higher than the actual ancillary service costs reported by DME, approximately 53% and 51% of the remaining cost savings (after the application of the lower heat rate and the reduction in cost savings) can be explained by the lower actual ancillary service cost.

# EMO Cost Review

## EMO Cost Considerations

For the EMO Cost, D&T reviewed the costs associated with running the EMO, and we focused on assessing the existence and/or absence of particular elements that are typically present in prevalent utility risk management programs. We observed the specific data provided by DME and assessed it to understand whether there were potential gaps and unconsidered costs in the EMO Cost calculation. Based on this review, D&T has compiled a list of considerations Exhibit 6.

**Exhibit 7: EMO Cost Considerations**

| Element | Consideration | Description |
|---|---|---|
| **Governance & Strategy** | | |
| Governance | Legislation and regulatory affairs (ERCOT, CFTC, FERC, NERC) | Given the increased scheduling, trading, and hedging activities required under the EMO operation, it could be important to consider legislation and regulatory impacts and may likely require some level of oversight. It does not appear that this cost is captured in the labor costs. |
| Governance | Risk oversight, senior management oversight, risk culture | Senior management time should be included as a select component of the risk oversight and control framework. It does not appear that this cost is captured in the labor costs. |
| Governance | Risk oversight, risk management committee, risk culture | While not large, some level of oversight by City management and City council should be included in the risk control and oversight costs. It does not appear that this cost is captured in the labor costs. |
| Strategy | Quantitative hedge strategy and hedge program design | Hedge strategy and program design is a critical component of an energy management function, especially one that is trading bilaterally and via an exchange. To facilitate greater than anticipated hedge loss/gains, a defined strategy should be developed and executed properly per the policy or to management business objectives. When done well, this includes a quantitative assessment of different hedge strategies. While it appears that there may be regular discussions regarding the hedge strategy, there is typically a hard dollar cost in the form of consulting services, software/technology, or modeling and simulation tools. |
| Compliance | Compliance oversight | The compliance function is an important aspect of a commodity trading and risk management program. It does not appear that this cost is captured in the labor costs. |

| Element | Consideration | Description |
|---|---|---|
| **People** | | |
| Risk Control | Middle/Back office support and risk control oversight | An appropriate amount of risk control and accounting personnel is required to provide risk oversight of the front office activities. As currently configured, it appears that the risk control and oversight resources may be out of alignment with the number of front office or energy marketers. Additional resources could add labor cost to the EMO Cost. |
| Technology | IT and software development support | Whether the commodity trading and risk management program is highly automated with a full suite of CTRM systems or whether the program is facilitated via spreadsheets and ad hoc models, the management of both requires some level of IT support. It does not appear that IT/software development support are fully captured in the EMO Cost. |
| **Process** | | |
| Controls | Internal audit and/or regular control reviews | A review of activities and controls is typically conducted once a year to assess the organization's controls, design and effectiveness. It is unclear whether this cost is captured in the EMO Cost. |
| Liquidity | Cost of capital | Careful consideration is typically given to the various uses of cash and the cost of deploying that cash to support the CTRM program. This can include margin to support exchange trading, collateral in support of bilateral transactions, and AR/AP for settlements of both financial and physical commodity. It does not appear that the cost of capital is considered in the EMO Cost. |
| Data and risk tools | Data, software licenses, membership fees | The full cost of data, licenses, risk tools, fees associated with memberships, etc. is important to capture and can be a substantial cost to the organization. It appeared from our review of the transactions that there may be some costs missing that could be present in a typical program. |
| **System** | | |
| Risk Reporting | Independent MtM, position, and risk reporting<br><br>Value-at-Risk ("VaR") calculations<br><br>Key Performance Indicators ("KPI") / Key Risk Indicators ("KRI") | Typically, organizations have a middle office/independent role calculate daily mark-to-markets for all transactions, develop position reports, provide risk reports, calculate VaR and KPI/KRIs. These are performed to determine appropriate risk oversight of the CTRM program. Additionally, it is typical that these reports are prepared via a system to avoid inefficiencies and human error. It is unclear from our review of the EMO Cost whether such a role or system exists. This could add significant cost to the EMO Cost. |

## EMO Cost Review Conclusion

While the list of EMO cost considerations presented in Exhibit 7 above could potentially reduce the cost savings and should be reviewed, this list should not be considered a comprehensive list. D&T reviewed the EMO costs and inquired about some specific aspects of a typical risk management program; however, it is difficult to identify all occurrences of missing costs considerations without a diligent review of the CTRM program and the governance, people, process and technology required to support the activities of the EMO and the energy management function. Additionally, in order to appropriately understand the future (or required) size, function, and capability of the EMO, it is important to understand risk profile, risk appetite, and hedging strategy. Accomplishing these two activities would allow the City to evaluate the potential risks posed by the EMO energy management activities. As such, D&T recommends the following next steps:

1. Risk profile and hedge strategy assessment: Consider quantifying the risk introduced by the decision move from an outsourced energy management model to an in-house management. Specifically, this should involve quantifying the impact of market, credit, and counterparty risk associated with the new activities of the EMO. Additionally, it should involve analyzing the EMO's hedge strategy, objectives, and should consider additional hedge strategies that could more effective in helping to achieve DME's risk management objectives.
2. EMO risk assessment: Consider having an independent assessment of the EMO's current and future capabilities required to support the EMO's mission, energy management and risk management activities. This should involve interviewing specific DME personnel involved in the execution of the program and develop an in-depth understanding of the EMO's existing activities and capabilities to identify potential gaps. It would also involve discussing and identifying DME's required future state to help drive recommendations to mitigate the risks introduced by the EMO and its activities.

# Appendix

## Detailed Support Tables

### Exhibit 8: DME Reported FY 15 Cost Savings

| DME Calculation FY 2015 | Total | 14-Oct | 14-Nov | 14-Dec | 15-Jan | 15-Feb | 15-Mar | 15-Apr | 15-May | 15-Jun | 15-Jul | 15-Aug | 15-Sep |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Benchmark** | 46,888,317 | 3,084,706 | 5,696,493 | 4,348,474 | 3,759,288 | 3,045,807 | 2,633,099 | 2,333,400 | 3,102,647 | 4,365,595 | 5,222,173 | 5,175,342 | 4,121,292 |
| **EMO** | 33,419,533 | 1,941,819 | 3,292,357 | 2,972,849 | 2,215,894 | 1,759,114 | 1,709,550 | 1,372,820 | 1,600,012 | 3,417,814 | 4,525,151 | 5,926,271 | 2,685,881 |
| **Savings** | 13,468,784 | 1,142,887 | 2,404,137 | 1,375,624 | 1,543,394 | 1,286,693 | 923,549 | 960,580 | 1,502,635 | 947,781 | 697,022 | -750,929 | 1,435,410 |

### Exhibit 9: DME Reported FY 16 Cost Savings

| DME Calculation FY 2016 | Total | 15-Oct | 15-Nov | 15-Dec | 16-Jan | 16-Feb | 16-Mar | 16-Apr | 16-May | 16-Jun | 16-Jul | 16-Aug | 16-Sep |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Benchmark** | 39,703,505 | 2,587,396 | 1,907,830 | 2,283,884 | 2,898,194 | 2,306,143 | 2,617,935 | 3,003,323 | 2,770,666 | 4,217,885 | 5,536,683 | 5,341,929 | 4,231,636 |
| **EMO** | 26,838,022 | 1,516,854 | 1,110,672 | 1,296,153 | 1,759,351 | 1,630,027 | 1,873,214 | 2,198,713 | 2,109,828 | 2,508,949 | 4,220,849 | 4,102,219 | 2,511,192 |
| **Savings** | 12,865,483 | 1,070,543 | 797,158 | 987,731 | 1,138,843 | 676,116 | 744,721 | 804,611 | 660,838 | 1,708,936 | 1,315,834 | 1,239,710 | 1,720,443 |

### Exhibit 10: Independent FY 15 Cost Savings

| Independent Calculation FY 2015 | Total | 14-Oct | 14-Nov | 14-Dec | 15-Jan | 15-Feb | 15-Mar | 15-Apr | 15-May | 15-Jun | 15-Jul | 15-Aug | 15-Sep |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Benchmark** | 46,878,558 | 3,065,584 | 5,695,949 | 4,353,212 | 3,759,288 | 3,045,807 | 2,635,943 | 2,333,400 | 3,102,647 | 4,364,206 | 5,225,887 | 5,175,342 | 4,121,292 |
| **EMO** | 33,400,290 | 1,936,850 | 3,269,757 | 2,974,010 | 2,212,494 | 1,755,227 | 1,704,877 | 1,372,452 | 1,597,732 | 3,420,819 | 4,550,998 | 5,904,450 | 2,700,624 |
| **Savings** | 13,478,267 | 1,128,734 | 2,426,192 | 1,379,202 | 1,546,794 | 1,290,581 | 931,066 | 960,948 | 1,504,915 | 943,386 | 674,890 | -729,107 | 1,420,667 |

## Exhibit 11: Independent FY 16 Cost Savings

| Independent Calculations FY 2016 | Total | 15-Oct | 15-Nov | 15-Dec | 16-Jan | 16-Feb | 16-Mar | 16-Apr | 16-May | 16-Jun | 16-Jul | 16-Aug | 16-Sep |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Benchmark** | 40,032,681 | 2,618,079 | 1,907,579 | 2,283,884 | 2,898,194 | 2,301,330 | 2,619,763 | 3,003,323 | 2,770,331 | 4,218,380 | 5,509,176 | 5,368,773 | 4,533,870 |
| **EMO** | 26,793,032 | 1,505,713 | 1,108,214 | 1,293,349 | 1,756,187 | 1,627,471 | 1,866,580 | 2,195,321 | 2,107,397 | 2,506,316 | 4,216,291 | 4,098,896 | 2,511,297 |
| **Savings** | 13,239,649 | 1,112,366 | 799,365 | 990,535 | 1,142,007 | 673,859 | 753,183 | 808,003 | 662,934 | 1,712,064 | 1,292,884 | 1,269,877 | 2,022,573 |

## Exhibit 12: Differences between Exhibit 7 and 9 (FY 2015)

| Difference FY 2015 | Total | 14-Oct | 14-Nov | 14-Dec | 15-Jan | 15-Feb | 15-Mar | 15-Apr | 15-May | 15-Jun | 15-Jul | 15-Aug | 15-Sep |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Benchmark** | 9,759 | 19,122 | 545 | -4,739 | 0 | 0 | -2,844 | 0 | 0 | 1,389 | -3,714 | 0 | 0 |
| **EMO** | 19,242 | 4,969 | 22,600 | -1,161 | 3,400 | 3,887 | 4,673 | 368 | 2,280 | -3,005 | -25,846 | 21,822 | -14,743 |
| **Savings** | -9,483 | 14,153 | -22,055 | -3,578 | -3,400 | -3,887 | -7,517 | -368 | -2,280 | 4,394 | 22,132 | -21,822 | 14,743 |

## Exhibit 13: Differences between Table 8 and 10 (FY2016)

| Difference FY 2016 | Total | 15-Oct | 15-Nov | 15-Dec | 16-Jan | 16-Feb | 16-Mar | 16-Apr | 16-May | 16-Jun | 16-Jul | 16-Aug | 16-Sep |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Benchmark** | -329,176 | -30,683 | 251 | 0 | 0 | 4,813 | -1,828 | 0 | 335 | -495 | 27,508 | -26,844 | -302,234 |
| **EMO** | 44,989 | 11,140 | 2,458 | 2,803 | 3,164 | 2,556 | 6,634 | 3,392 | 2,431 | 2,633 | 4,558 | 3,323 | -105 |
| **Savings** | -374,165 | -41,823 | -2,207 | -2,803 | -3,164 | 2,257 | -8,461 | -3,392 | -2,097 | -3,128 | 22,950 | -30,167 | -302,12 9 |

## Exhibit 14: OTC ERCOT North ATC / OTC Houston Ship Channel (Average Monthly Heat Rate of ERCOT North ATC)

| Year | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec | Average |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **2013** | - | 7.79 | 8.19 | 8.5 | 8.86 | 10.76 | 14.57 | 18.07 | 9.8 | 8.01 | 8.33 | 8.44 | **10.12** |
| **2014** | 8.75 | 8.28 | 8.57 | 8.79 | 8.81 | 10.93 | 14.28 | 17.3 | 9.89 | 8.48 | 7.78 | 7.82 | **9.97** |
| **2015** | 8.74 | 8.57 | 8.63 | 8.99 | 8.77 | 10.67 | 13.8 | 16.36 | 9.69 | 8.53 | 8.08 | 8 | **9.90** |
| **2016** | 8.65 | 8.68 | 8.59 | 8.96 | 8.62 | 9.89 | 12.75 | 16.22 | 9.43 | 8.42 | 8.08 | 7.9 | **9.68** |
| **2017** | 7.85 | 8.48 | 8.34 | 8.68 | 8.34 | 9.54 | 12.02 | 15.22 | 9.12 | 8.15 | 7.8 | 7.6 | **9.26** |
| **2018** | 8.19 | 8.17 | 8.03 | 8.45 | 8.13 | 9.31 | 12.11 | 15.24 | 8.93 | 7.96 | 7.64 | 7.44 | **9.13** |
| **2019** | 8.13 | - | - | - | - | - | - | - | - | - | - | - | **8.13** |
| **Average** | **8.39** | **8.33** | **8.39** | **8.73** | **8.59** | **10.18** | **13.26** | **16.40** | **9.48** | **8.26** | **7.95** | **7.87** | **9.65** |

## Exhibit 15: OTC ERCOT North On-Peak / OTC Houston Ship Channel (Average Monthly Heat Rate of ERCOT North On-Peak)

| Year | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec | Average |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **2013** | - | 9.64 | 9.70 | 10.18 | 10.16 | 13.29 | 21.04 | 26.09 | 11.60 | 9.35 | 8.95 | 8.83 | **12.62** |
| **2014** | 9.44 | 9.19 | 9.45 | 9.77 | 9.67 | 13.14 | 19.30 | 24.46 | 11.48 | 9.78 | 9.18 | 8.93 | **11.98** |
| **2015** | 9.80 | 9.80 | 9.91 | 10.38 | 9.97 | 13.07 | 18.71 | 23.29 | 11.36 | 9.77 | 9.22 | 9.04 | **12.03** |
| **2016** | 9.66 | 9.82 | 9.81 | 10.44 | 9.81 | 12.51 | 17.30 | 23.22 | 11.16 | 9.71 | 9.28 | 9.01 | **11.81** |
| **2017** | 9.55 | 9.64 | 9.64 | 10.13 | 9.51 | 11.90 | 15.99 | 21.84 | 10.77 | 9.37 | 8.91 | 8.72 | **11.33** |
| **2018** | 9.22 | 9.30 | 9.29 | 9.85 | 9.31 | 11.63 | 16.26 | 22.05 | 10.60 | 9.12 | 8.65 | 8.45 | **11.14** |
| **2019** | 9.19 | | | | | | | | | | | | **9.19** |
| **Average** | **9.48** | **9.57** | **9.64** | **10.13** | **9.74** | **12.59** | **18.10** | **23.49** | **11.16** | **9.52** | **9.03** | **8.83** | **11.77** |

Glossary[5]

- **Bilateral:** A two sided transaction, i.e., a buyer and a seller agree to exchange a commodity for a fixed price.
- **Capacity:** The maximum amount that something can contain, for instance pipeline capacity or generation capacity.
- **Congestion:** The cost of overcoming obstacles in the path of power delivery.
- **DAM:** Day Ahead Market, i.e., a bilateral market for the delivery of power on the following day.
- **Demand:** The amount of energy required to meet end user needs.
- **Demand Response:** An intentional action intended to decrease the power need of end users in order to offset demand in excess of supply that is driving unreasonable high power prices.
- **ISO:** Independent System Operator, i.e., a not for profit organization responsible for the orderly and reliable operation of an electric grid. In Texas, this is ERCOT.
- **ERCOT:** Texas ISO – Energy Reliability Council of Texas.
- **Feedstock:** The fuel used to generate power; natural gas is typically the default fuel used by the financial markets, regardless of actual use or not, to calculate metrics like heat rates.
- **Fixed Price:** The agreed to price in a bilateral transaction. The price is fixed at the point of purchase and does not change.
- **Forward Curve:** The financial market-defined price/value for a specific time period in the future usually in monthly increments. The value continually changes reflecting buyers' and sellers' perception of changing market dynamics.
- **Heat Rate:** Represents the efficiency of power generation. It is the multiplier applied to natural gas to calculate the price of power for a particular period of time. Its origin was an engineering expression of the relative efficiency of the conversion of a fuel to electricity. It has morphed into a financial expression regarding the value of generation.
- **ICE:** Intercontinental Exchange. ICE offers market participants a range of trading and risk management services globally. When transacting on the Intercontinental Exchange it is referred to as exchange trading.
- **LMP:** Locational Marginal Pricing, i.e., the real time price for electricity at a specific geographical location.
- **Load:** End use of retail power; the consuming customer.
- **Peak Demand:** The maximum amount of power required by a load for a specified period regardless of duration.
- **Physical Delivery:** The process of bringing energy from a source to a destination. It is the actual commodity.
- **Real Time:** Daily (LMP) cost plus power pricing venue as determined by supply and demand market forces, historically the average lowest cost but with open ended upside risk.
- **Risk Management:** The identification and management of variables that may adversely affect intended results guided by a defined, transparent discipline.
- **Wholesale Market:** The bilateral (buyer and seller) financial market in deregulated jurisdictions where block power is traded.

[5] Source: http://www.infinitypowerpartners.com/market-information/glossary/