

Denton Municipal Electric

Energy Risk Management Policy

Approved by City of Denton Texas City Council

City Ordinance No. 2018-____



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SECTION 1 PROGRAM OVERVIEW

1.1 Introduction

Denton Municipal Electric (“DME”), is in the business of providing affordable and reliable energy and energy services to its customers in an environmentally sustainable manner. This Energy Risk Management Policy (“Policy”) has been developed to establish a comprehensive framework for DME to meet and exceed the overall goals and objectives set by the City Council, subject to approved risk tolerances.

This Policy provides specific controls (e.g., segregation of duties, oversight, etc.) for the management of strategic and operational risks and establishes guidelines for DME to plan, execute and control the risks inherent in the generation, purchase and sale of energy for its retail customers. The resulting framework shall govern DME’s energy portfolio activities through which City Management and DME personnel identify, capture, measure, manage, control, monitor and report financial and other risks. This program specifically addresses management of energy portfolio risk and provides a framework to maintain proper controls over portfolio activities as they change over time.

1.2 Objective

DME, through the Risk Management Committee, will establish specific goals and objectives for the Energy Price Risk Management Program (“Program”) to minimize the impact to electric rates attributable to energy supply variability and to fuel and energy price volatility. The objective of this Policy is to maximize benefits to customers from short-term, market-based hedging activities while minimizing the risk that such activities will adversely affect retail prices. DME, through the RMC, will develop and implement a plan which will support the overall goals and objectives of the Program.

1.3 Energy Risk Management Framework

DME’s Energy Risk Management Policy shall be built around a framework that includes the following four elements: Organizational Objectives, Risk Mitigation and Measurement, Portfolio Management and Risk Control Infrastructure. Each of these elements is discussed further below.

1.3.1 Organizational Objectives

The RMC will approve goals, strategies, and objectives which help define the appropriate portfolio management activities that will to be undertaken by the EMO. This will be done

through strategic and business planning activities conducted in establishing the budget and through periodic strategic planning activities.

1.3.2 Risk Mitigation and Measurement

As part of clarifying organizational objectives, this Policy will define the EMO's role in identifying, measuring and mitigating energy risks. DME's risk mitigation practices will focus on conservative transaction and risk exposure limits.

1.3.3 Portfolio Management

DME will engage in transactions that shall be conducted in accordance with risk management and transaction limits specified in connection with this Policy and in broader DME policies and operating procedures.

1.3.4 Risk Control Infrastructure

DME will maintain a collection of internal controls, systems, and processes necessary to achieve the objectives of this Policy. These controls comprise DME's energy risk control infrastructure and shall include provisions for:

- Energy Risk Management Organization Structure and Responsibilities
- Transaction and Risk Exposure Limits
- Portfolio Position Tracking
- Risk Measurement and Mitigation
- Performance Measurement
- Management Reporting
- Operating Procedures

1.4 Procedures and Guidelines

This Policy prescribes the management, organization, authority, processes, tools and systems to monitor, measure, control and mitigate market risks through DME's energy management activities. Upon adoption by the City Council, this Policy shall be implemented through a supporting set of standard operating procedures ("EMO Procedures Manual"). The operating criteria and parameters shall be updated as necessary to reflect changes in market conditions and staffing levels. All standard operating procedures shall be approved by the RMC.

All departmental procedures that may impact DME's energy portfolio shall be in full compliance with this Policy. DME executive management shall evaluate the degree of detail necessary in the operating procedures and may require that additional procedures be developed and implemented.

1.5 Policy Review

Following approval of this Policy, the Risk Management Committee shall periodically, but no less than annually, review the Policy and recommend updates, or provide notice that no updates are recommended, as necessary, to the PUB and City Council. Examples of events prompting Policy updates and reviews are significant changes in regulatory requirements, the resource portfolio, fuel prices of alternative resources, political direction or reliability concerns.

Because the results of this type of risk management program must be continually evaluated in relationship to the City's objectives to ensure effective performance, this Policy shall be reviewed and reauthorized annually by the City Council.

SECTION 2 ORGANIZATION STRUCTURE

2.1 Risk Management Committee (“RMC”)

Consistent with leading industry best practices, the executive oversight structure of the EMO be conducted through the Risk Management Committee (“RMC”). The RMC shall also be responsible for activities governed by this Policy and to ensure Policy requirements are met. The RMC membership will be comprised of five voting members and two non-voting members.

The RMC has the responsibility for executive oversight over the Program, which includes:

- Ensuring Program strategies are consistent with overall City goals and obligations.
- Approving changes to portfolio management strategies
- Reviewing program results periodically
- Approving changes to new transaction types
- Approving market exposure measurement criteria
- Approving the credit limit framework, including credit limit criteria, exceptions and maximums
- Ensuring the review and approval of operating procedures
- Reviewing and monitoring DME’s proximity to transaction and risk exposure limits
- Ensuing evaluation of credit limits and credit rating methodologies are regularly conducted for energy companies that are conducting business with the EMO to buy and sell energy (“counterparties”)
- Discussing the execution of portfolio management strategies

2.1.1 Risk Management Committee Structure

The five voting members are:

- PUB Chair (or designee) – Ex Officio Member
- Deputy City Manager
- DME General Manager (Chairman)
- DME Compliance Manager
- City Director of Finance

The two non-voting members are:

- City Auditor
- Deputy City Attorney – Legal

Other key personnel may participate in RMC meetings as needed.

The RMC will meet as necessary and will be responsible for prudent implementation of this Policy and operational oversight of the Program.

2.1.2 Meeting Timing, Frequency, Member Vacancies and Voting Procedures

The RMC will be responsible to the Public Utilities Board and City Council for prudent executive oversight of this Policy and shall meet no less than once per calendar quarter. Member attendance shall be recorded in the RMC meeting minutes. Any member of the RMC can request an emergency meeting of the RMC to address circumstances or issues that may require immediate attention. As needed, but not less than annually, the RMC will report results of the EMO activities and compliance with this Policy to the Public Utilities Board and the City Council.

Each of the five voting members shall have a single vote on matters that come before the RMC and a voting member, or designee, must participate in the RMC meeting in order to vote and approve a proposed action. If a voting member is unable to attend an RMC meeting in person or by telephone, the member may designate an alternate to vote in his or her absence. If any two of the voting members, or their designees, are not present at an RMC meeting, a vote on a proposed action cannot take place. The RMC will make decisions and take actions by a simple majority vote. If the RMC reaches an impasse that cannot be addressed through a vote, the DME General Manager will make a final decision by the end of the next business day.

In cases where a member of the RMC leaves the employ of the City, the DME General Manager will resolve the RMC vacancy by making an interim appointment at his discretion.

A standard set of reports shall be prepared and distributed by the Chairman in advance of the meeting. The representative from the Office of the City Attorney will act as Secretary to the RMC and will document all meetings and actions taken by the RMC in meeting notes that will be distributed to RMC members for their review and acceptance. Meeting notes approved by the RMC will be distributed by the Office of the City Attorney to the RMC members, the City Manager, City Council and PUB.

As Chairman of the Risk Management Committee, the DME General Manager is responsible for all EMO activities, including the day-to-day efforts of the risk control function. At a high level, these responsibilities include understanding and measuring market risk, validating risk mitigation activities, hedge strategy compliance and risk reporting.

2.2 Front, Middle, and Back Offices

The “Front-Middle-Back Office” model provides for segregation of duties and efficient administrative support. It is a way to segregate EMO activities into transactional (“Front Office”), independent risk control and transaction compliance (“Middle Office”) and financial, accounting, and contact administration support (“Back Office”) functions.

2.2.1 Front Office

The Front Office is primarily responsible for resource planning, and procuring energy supplies and service. The resource planning function includes defining clear objectives and developing measurable hedge strategies which can be rigorously tested via simulation. The Front Office will develop hedging plans and perform hedge strategy simulations at least annually to confirm and update DME's ongoing strategy.

Implementation details of hedging plans and strategies are under development and will be incorporated into this Policy as part of Phase 2.

The Front Office oversight role is accomplished through supervisory review and approval. DME's Front Office consists of EMO personnel and the Market Operations Manager.

2.2.2 Middle Office

The Middle Office provides the primary independent management oversight role. The Middle Office institutes and reviews energy portfolio management activities, such as portfolio credit exposure, transaction compliance and approval of counterparties. The Middle Office also quantifies risk exposure of native business activity (including both price and volumetric uncertainty), excluding hedges. In the event hedge decisions do not achieve program objectives, the Middle Office will determine why the objectives were not achieved and recommend to the RMC how to re-align hedge decisions with program objectives to promote improved effectiveness.

The Middle Office responsibilities include monitoring EMO's risk exposures and mitigation measures and ensuring compliance with policies, guidelines, and procedures. In connection with this responsibility, the Middle Office will maintain a compliance log of any operational and/or procedural violations, which can be used to monitor issues and their severity, frequency and resolution.

Implementation details of hedging plan, hedging strategy and hedging effectiveness report are under development and will be incorporated into an appendix to this Policy as part of Phase 2.

Additionally, the Middle Office is responsible for recommending to the RMC when changes in policy or operating procedures are required. These recommendations may involve the temporary or permanent halting of transactions with one or more

counterparties, and any other topic the Middle Office believes represents potential unacceptable risk exposure.

The Middle Office adopts and updates, as necessary, the Energy Risk Management Policy, guidelines and procedures so that portfolio management functions occur in compliance with Energy Risk Management Policies and energy risk procedures and guidelines.

2.2.3 Back Office

The Back Office is primarily responsible for settlement of ERCOT and counterparty billings, recording transactions, and contract administration. The Back Office roles in oversight include ensuring that invoices accurately reflect confirmation orders, independently monitoring and recording transactions into a tracking database, and verifying and reporting on compliance with procedures as reflected in transaction tracking documentation.

SECTION 3 MARKET RISK PROTOCOLS AND EXPOSURE CONTROL

3.1 Market Risk Protocols

The following market risk protocols shall govern DME's participation in wholesale energy markets. Specific limits, methodologies, reports, operational procedures and approval processes shall be detailed in the EMO Procedures Manual.

- DME will ensure that it has full knowledge of its position in all transacted products and the resulting exposure, and understands the implications of its energy management activities;
- Only personnel authorized by the DME General Manager, or his designee, pursuant to a written Delegation of Authority Memorandum can transact on behalf of DME in the wholesale energy market (see Transaction Limits section of Appendix A);
- The EMO will ensure it obtains competitive prices, transacts "at the market" and diversifies its counterparty credit risk by setting up master agreements [such as the International Swaps and Derivatives Association, Inc. (ISDA), Edison Electric Institute (EEI), and the North American Energy Standards Board (NAESB)] with as many pre-qualified financial counterparties as possible.
- DME may only transact in wholesale energy-market products approved by the RMC;
- DME may only transact within transaction limits approved and defined in this Policy and the EMO Procedures Manual;
- All wholesale energy transactions will be carried out on recorded phone lines, electronic trading platforms, or other media that can be recorded and documented;
- Metrics for assessing DME's market risk exposure will be specified, measured, monitored, and reported on a regular basis to the RMC;
- On a daily basis, all wholesale market transactions will be captured in the official system of record which will capture and report physical and financial positions so that each can be reviewed separately and in total so that net price risk and collateralization requirements can be accurately assessed and managed in real time. This system will also serve as a central check and balance tool; therefore, it will allow for reconciliation of physical and financial confirmations with transactional input. This system will also generate net price risk information.
- Models and inputs for valuation and risk measurement and mitigation shall be subjected to a validation and change control process. The models employed and associated processes shall be described in detail in the EMO Procedures Manual; and

3.2 Authorized Transactions

Authorized types of transactions are addressed in Appendix E of this Policy. These transactions types are, and shall continue to be, focused on supporting the energy portfolio goals of the City

Council. The addition of any new transaction types, including the revision of existing transaction types, shall be controlled through written operating procedures and approved by the RMC

3.3 Market Risk Control

An important element to any energy risk management and mitigation program is the regular identification, measurement, and communication of market risk. DME's net "open" position (i.e., whether it needs to buy or sell energy on a daily, hourly or monthly basis to balance customer loads against available generating resources) and the market exposure associated with these net positions shall be quantified and compared against exposure limits contained in this Policy and discussed, on a regular basis, within the RMC.

Market exposure associated with these net positions shall be quantified using forms of measurement approved by the RMC. The market exposure measurement criteria shall be reviewed at least annually and consider changes in DME's net positions and existing and projected market conditions. The Middle Office shall have primary responsibility for coordinating the development, maintenance, and modification all market measurement methodologies within DME and for recommending approval of these methodologies by the RMC.

3.3.1 Risk Tolerance

For the purposes of this Policy, DME's Energy Risk tolerance is defined by the degree of uncertainty that DME can accept in its future financial ratios and customer rates on a projected basis.

DME's Energy Risk tolerance and measurement of Energy Risk shall be based on Cash Flow at Risk ("CFaR") or Value at Risk ("VaR") forms of risk measurement, augmented with scenario analysis and stress testing. These forms of risk measurement are described in more detail in Appendix A – Risk Exposure and Transaction Limits.

3.3.2 Transaction and Exposure Limits

The setting of and the adherence to transaction limits is an important control element to ensure DME does not assume greater aggregate energy market exposure than is intended and helps ensure that the transaction strategy level is appropriate at various levels of aggregation (e.g. by commodity, delivery period, strategy, Energy Market Operator, etc.).

Appendix A and D, along with the EMO Procedures Manual, contain the Approved Transaction Types and the Transaction Limits for DME. It is the responsibility of the Front Office, Middle Office and the RMC to effectively utilize these limits to control and mitigate risk-taking activities. The Front Office shall be responsible to monitor and recommend changes in Transaction Limits to the RMC when market conditions or operating circumstances result in limits becoming ineffective or inappropriate in controlling these activities.

The Middle Office shall be responsible for maintaining all Transaction Limits, monitoring compliance with the Transaction Limits, and obtaining approval from the RMC for any changes to Transaction Limits or the Transaction Limit structure. It is the responsibility of the Middle Office and Front Office to ensure that Transaction Limits are strictly enforced.

3.3.3 Stress Testing

In addition to limiting and measuring financial exposure using the methods above, stress testing shall also be used to examine performance of the energy portfolio under extreme adverse conditions.

In stress testing, worst-case historical as well as hypothetical market conditions are applied to the portfolio to determine how the portfolio will perform if such conditions were repeated. Stress testing requires thorough evaluation of past market periods to determine those that would represent a worst-case event. In addition, the performance of the portfolio is also estimated for individual and combined hypothetical market conditions. Such conditions are intentionally chosen to represent extremely unlikely and adverse conditions and combinations of conditions.

The Middle Office shall design and maintain a stress testing program, in consultation with the Front Office. The stress testing approach shall be reviewed by the Middle Office semi-annually, and the stress testing program shall be presented to the RMC for review on at least an annual basis.

Implementation details of model validation, controls framework and stress testing are under development and will be incorporated into an appendix to this Policy with details addressed in an Operating Procedure as part of Phase 2.

3.4 Credit Risk Control

Credit Risk is the potential impact on DME's financial performance due to the hypothetical chance of non-performance in payment or delivery (either physical or financial) by an energy company that has executed a commercial agreement with DME to buy and sell energy ("counterparty").

DME will actively mitigate its energy credit risk by making informed decisions regarding which counterparties to transact with and to what degree. Credit risk is defined as the risk of counterparty nonperformance, or failure to deliver its obligation (whether that is an energy product itself or the payment of amounts owed).

3.4.1 Credit Policies

DME mitigates its energy credit risk by

- Incorporating the expected transacting volumes, timing, and expected energy prices, when establishing an energy credit risk tolerance for a calendar year;
- Assessing counterparty creditworthiness and establishing credit limits for counterparties based on that assessment;
- Requiring a counterparty to be assigned a credit limit prior to transacting with it;
- Monitoring and assessing market and counterparty events to adjust credit limits as appropriate;
- Calculating and reporting the maximum expected loss if a counterparty defaults (“counterparty credit exposure”); and
- Requiring all transactions in the forward markets (prompt month and beyond) to be planned for and included in an approved energy management plan prior to execution of the transaction

3.4.2 Credit Limits

The EMO Procedures Manual shall include a credit limit framework for DME’s counterparties based on various factors such as debt ratings and financial statistics. Specific counterparty credit limits will include consideration of financial ratios, audited financial statements, and asset quality. Credit limits on all counterparties will be reviewed at least semi-annually by the Middle Office, or immediately if their business conditions change or their credit rating has been downgraded.

Prior to execution of any transaction with a counterparty, the Front Office must verify that the counterparty has available credit. In addition, no transaction shall be executed that will cause the counterparty credit limit to be exceeded unless explicitly approved by the RMC.

3.4.3 Counterparty Credit Function

The counterparty credit function concerns counterparty credit analysis and approval of new and existing counterparties as well as the calculation, aggregation, monitoring and reporting of credit exposures. DME’s credit function is organized within the Middle Office and reports to the DME Compliance Manager.

The objective of the counterparty credit function is to minimize the potential adverse financial impacts on DME in the event of a potential default by a counterparty. The counterparty credit function will minimize DME’s credit exposure and potential adverse financial impacts by:

- Establishing a credit risk mitigation structure within the energy risk management

- program;
- Providing a framework to enable DME to qualify energy suppliers and transact with approved counterparties;
- Determining counterparty transacting parameters (“transaction limits”) to conservatively control and measure DME’s exposure to any one supplier; and
- Implementing conservative business processes and procedures (to be included in the EMO Procedures Manual) to gather and monitor financial information on each counterparty to estimate counterparty credit exposures

3.4.4 Exceptions to Credit Limits

If EMO personnel determine that the credit limits set forth in the EMO Procedures Manual should be exceeded for certain key counterparties, they may request that the Middle Office perform a review to determine if the counterparty could support a higher credit limit. The Middle Office shall perform a financial/credit analysis and, if the analysis determines that the counterparty could support a higher credit limit, the Middle Office will make a recommendation to the RMC for review and approval of extending additional credit to the counterparty.

3.5 Information Systems and Models

Energy risk management information systems consist of the data, models and other software and hardware used to collect, analyze, test, and validate transactions within DME’s portfolio in order to monitor and control risk. Although various departments within the City of Denton or DME may have responsibilities for using and maintaining DME’s risk management systems, the Middle Office shall have overall responsibility for ensuring that the systems are sufficient to perform the risk management functions outlined in this Policy.

As part of a service level agreement with the City of Denton Technology Services, the Middle Office shall also be responsible for maintaining the security, integrity and reliability of the software used for energy risk management purposes (e.g. valuation models, administrative and reporting software, energy risk management databases, etc.).

In accordance with the Service Level Agreement between DME and the City of Denton Technology Services, Technology Services shall be responsible for maintaining the integrity and reliability of the hardware used for both energy management and energy risk management purposes, including business continuity, disaster protection and recovery plans.

SECTION 4 RISK REPORTING

4.1 Risk Management Reporting Policy

Key to energy risk management is the monitoring of risks and the accurate and timely information that must be provided to all parties involved in any aspect of energy risk management to allow them to perform their functions appropriately. The separation of execution and reporting responsibilities ensures that timely and accurate information is being reported.

On an annual basis, the RMC Chairman will meet with the PUB and City Council and provide details of the EMO's forward purchases, market exposure, credit exposure, counterparty credit ratings, transaction compliance and other relevant data. In addition, the EMO will provide periodic training to the PUB and Council on energy market fundamentals and commodity trading best practices to help facilitate more productive risk meetings.

4.2 Required Reports

Minimum reporting requirements are listed below and shall be prepared for the RMC by the Middle Office and reviewed by both the Middle Office and Front Office. Minutes and meeting materials from quarterly RMC meetings will be distributed to the PUB and Council for their review.

Controls Compliance Report

Identifies any activities that have exceeded permissible limits.

Hedge Target Compliance Report

Provides an understanding of the status of portfolio exposure relative to program targets.

Hedge target metrics are under development and will be incorporated into an appendix to this Policy as part of Phase 2.

Competitiveness Report

Provides a comparison of latest 12-month cost/mwh vs ERCOT spot markets (Day-Ahead and Real-Time Market)

Renewable Resource Effective Cost Report

Tracks the effective cost of each renewable resource, including the cost of market purchases when renewables output is insufficient to meet load.

Price Risk Reduction Report

Measures the total market risk exposure for each counterparty within DME's energy portfolio, the aggregate market risk exposure, and the effectiveness of DME's hedging activities.

Risk reduction metrics are under development and will be incorporated into an appendix to this Policy as part of Phase 2.

Credit Exposure Report

Identifies the credit limit for each counterparty, current level of exposure with the counterparty, and remaining available credit.

4.3 Transaction Valuation

DME's financial records will be maintained in full accordance with generally accepted accounting principles ("GAAP") and will be consistent with FERC Uniform System of Accounts.

Front, Middle, and Back Office functions shall coordinate their efforts and maintain vigilance to ensure that DME's energy management transactions and risk exposures are accurately valued in an unbiased manner. Transaction valuation and reporting of positions shall be based on objective, market-observed prices or models as authorized by the RMC.

Open positions (i.e., whether the EMO needs to buy or sell energy on a daily, hourly or monthly basis to balance customer loads against available generating resources) should be valued ("marked-to-market") daily, based on consistent valuation methods and data sources. Whenever possible, these valuations shall be based on independent, publicly available market information and data sources (e.g., Bloomberg, Reuters, NYMEX, ICE, broker quotes, etc.). The Middle Office shall develop, and the RMC shall approve, valuation standards for those cases where data is not publicly available. It is important that the data used for valuation, reporting and other energy risk management calculations represent accurate and timely information from the market or be based upon appropriate RMC-approved internal sources or models.

The specification of position valuation methods is the responsibility of the Middle Office under the direction of the RMC. The Front Office is responsible for obtaining and disseminating market information in a timely and consistent manner. It is the responsibility of the Front Office to maintain and update transaction data and information sources used for trade evaluation and decision-making. The Middle Office is responsible for assuring that data used for energy risk

management calculations represent accurate and timely information available from RMC-approved market or internal sources.

SECTION 5 OTHER RESPONSIBILITIES AND POLICIES

5.1 Organization-Wide Responsibilities

It is the policy of DME and the City of Denton that all personnel adhere to standards of integrity, ethics, conflicts of interest, compliance with statutory law and regulations and other applicable standards of personal conduct.

The willful misrepresentation or concealment of information regarding portfolio management and/or risk management activities from senior management or any person responsible for the accurate tracking and reporting of such activities shall result in disciplinary action up to and including termination in accordance with DME and City of Denton policies and possible legal action as allowed or required by law.

As an employee of the City of Denton, all EMO personnel should not have an expectation of privacy in the conduct of their duties. At any time, recorded phone calls and electronic transactions may be reviewed to ensure appropriate conduct or to review transactional information.

5.2 Commercial Interests and Trading for Personal Accounts

All DME personnel who have any specific responsibilities delineated under this Policy or in departmental procedures that support this Policy are strictly prohibited from engaging in any of the activities listed below:

- Physical or financial trading of any commodities or authorized instruments stipulated in this Policy or in supporting departmental procedures for their own account
- Holding a major undisclosed interest in any account or corporate entity (other than DME), which is used to trade the instruments and commodities described above.

If there is any doubt as to whether a prohibited condition exists, then it is the employee's responsibility to discuss the possible prohibited condition with their supervisor. In addition, any employee receiving taxable income from any person or business doing business with DME must file a Conflicts Disclosure Statement in accordance with Chapter 176 of the Texas Local Government Code. Failure to comply with these requirements may result in disciplinary action up to and including immediate termination of employment, in accordance with DME and City of Denton policies.

5.3 Acknowledgment of Policy Requirements

All DME personnel connected with the energy risk management program must sign a statement attesting that they have received, read, and understand this Policy document and the City of Denton policies regarding employee conduct. A sample form is provided in Appendix F.

Appendix A RISK EXPOSURE AND TRANSACTION LIMITS

The EMO's energy supply, trading and risk management-related activities shall be segregated among a number of "risk books." A risk book is a way of classifying and tracking positions and transactions that have similar or directly related purposes so that value and risk can be measured in sufficient detail to support both risk control and transaction strategy decisions.

These risk books, along with risk exposure and transaction limits, are described below.

A.1 Risk Books

System Book

The System Book captures the value and risk position of native load obligations and long-term power and fuel supply obligations. All positions in the System Book shall be of duration greater than one month or a transaction start date of greater than one month into the future.

Hedge Book

The purpose of the Hedge Book is to track all positions that are entered into to reduce the total net risk exposure of the System Book. All transactions maintained in the Hedge Book shall be demonstrated to be highly effective (on a prospective basis) in mitigating the underlying source of risk to DME native load, generation assets and long-term power and fuel supply obligations.

Total Portfolio Book

The Total Portfolio consists of the combination of all positions in the System Book and Hedge Book.

A.2 Risk Exposure Limits

An essential control element in the management of market risk is the development and adherence to an appropriate limit structure. A well-designed limit structure helps ensure the EMO does not assume greater aggregate risk than intended and helps ensure that risk taking at the transaction strategy level is appropriate at various levels of aggregation (e.g., by commodity, delivery period, strategy, etc.).

The primary forms of limits listed below shall be applied to the EMO:

Rates at Risk – Rates at Risk (“RaR”) is a form of CFaR risk measurement. RaR limits will be set to limit the amount of uncertainty in future rates over the immediately upcoming 12-24 month period. If uncertainty in future rate requirements is higher than DME’s risk tolerance, the EMO will be required to consider hedging or implement other risk management strategies to reduce the potential need for large unforeseen rate increases and/or deterioration of DME’s financial condition.

Value at Risk –Value at Risk (“VaR”) limits will be set to limit the potential loss in value of individual transactions or groups of transactions which may be held in the portfolio for specific purposes, and/or to limit the size and risk associated with net trading positions if such activities are allowed.

Notional/Volumetric –To augment RaR and VaR limits, notional limits and/or volumetric limits may be established. Notional limits are specified based on transaction or strategy dollar amount (i.e., contract or strategy volume x price). Volumetric limits are specified based on volume (e.g., MW, MWh, MMBTU, etc.). This will provide a concrete limit to account for uncertainties in risk measurement and human judgment capabilities. Other volumetric limits may be established in relation to specific risks not captured by RaR or VaR.

ERCOT – Implementation of the ERCOT Real Time Market (RTM) and Day Ahead Markets (DAM) require daily attention to Available Credit Limits (ACL) and forward liability calculations. The Back Office shall actively monitor and communicate any changes affecting current credit positions.

Hedge Ineffectiveness -Setting limits relative to anticipated hedging strategies which help limit potential losses in the event a hedging strategy (or portion thereof) becomes partially or fully ineffective.

Stop Loss –Stop loss limits are set, such that, if an individual position or strategy (or a hedge transaction or strategy which has become ineffective) is performing adversely and approaches a predetermined level of losses, the position or strategy must be liquidated or completely hedged to prevent further loss. For example, if a forward fuel purchase ends up not being needed because of an unforeseen plant outage, it is important to limit the magnitude of mark-to-market losses that may accrue on the purchase.

A.3 Total Portfolio Risk Exposure Limits

Energy and fuel risk exposure of DME’s portfolio shall be managed based on Rates at Risk (RaR). RaR is the difference between the total expected revenues from the Energy Cost Adjustment and

the potential revenue requirement needed to fully cover potential net fuel and power supply costs.

RaR limits for the total portfolio are:

	Warning Limit	Hard Limit
Rolling 12 months (in aggregate)	\$XX million	\$XX million
June through September (in aggregate)	\$XX million	\$XX million
Any single month within rolling 12 months	\$XX million	\$XX million

Assumptions and specific limits associated with “at risk” metrics will be incorporated into this appendix as part of Phase 2.

A.4 Open Position Management

Market transactions shall be executed as a result of strategies designed to maintain the net open position (the gap between expected demand and committed supply) within tolerances which are consistent with current hedging strategies. The resultant net open position shall be updated to reflect the new transactions as soon as practical, but generally no later than the next business day.

Net open position energy tolerances shall be set at the following

Period	Minimum Tolerance	Maximum Tolerance
Prompt Month	xx % of load	xxx % of load
Prompt Quarter	xx % of load	xxx % of load
Balance of Year	xx % of load	xxx % of load
Prompt calendar year	xx % of load	xxx % of load
Second calendar year	xx % of load	xxx % of load
Third calendar year	xx % of load	xxx % of load

Tolerance limits are under development and shall be set as part of Phase 2.

A.5 Transaction Limits

Another vital control element in the management of energy risk is the development and adherence to transaction limits. Transaction limits ensure the energy portfolio management function is appropriate, deliberate and controlled at various levels of position aggregation and transaction duration. Transaction limits are established in consideration of overall portfolio strategies, market conditions and risk tolerance levels and include the following principles:

- EMO personnel are authorized to execute any intra-day or day-ahead transaction which is necessary to mitigate market and financial risk exposure to DME customers.
- Speculative transactions are those transactions with increase DME's risk exposure and are strictly prohibited. All transactions shall either reduce risks or be risk-neutral to DME customers.
- No transaction may be executed for which DME does not have adequate systems or analytical methods to track, record, value, or analyze the incremental cash flow and risk.
- Any single transaction for a term greater than two years must be approved by the RMC prior to execution.
- Scheduling of loads and resources, along with corresponding bid or offer prices associated with ERCOT Day Ahead Market (DAM) or ERCOT Supplementary Ancillary Services (SASM) Market are not subject to this Risk Policy or to the limits outlined below and do not require prior RMC approval.

All executed transactions must be evidenced by a paper confirmation that includes a time/date stamp. Further, all transactions shall be conducted on recorded phone lines, electronic trading platforms, or other media that can be recorded and documented. All confirmations must be signed by the person with the authority to enter into such transaction. Confirmations for transactions with ERCOT are evidenced through the ERCOT Settlement Summary statement.

The following tables outlines the transaction authorization limits established for EMO personnel when executing transactions. EMO personnel are permitted to execute transactions less than or equal to their designated limits or under the direction of someone having the required authority. Only the Approved Transaction Types listed in Appendix D may be executed unless approved by the RMC.

A.5.1 Bilateral or Financial Power Transaction Limits

Title	Term	Lead Time	Transaction Size (MW)
City Council	No Limit	No Limit	No Max
City Manager	≤ 1 Year	≤ 3 Years	100
DME General Manager	≤ 1 Year	≤ 2 Years	100
Market Operations Manager	≤ 1 Month Day Ahead to 1 Month	≤ 12 Month	50
Senior Energy Market Analyst	≤ 1 Week Day Ahead to balance of week	≤ 1 Week	100
Energy Market Operator	≤ 1 Day Hourly to balance of day	≤ 1 Day	400

Notes:

- Transaction Limits represent MW volume per hour.
- Lead time represents the time period from the date a trade is executed to the start of delivery.
- Authorized products include electric power, including both physical and financial derivatives, as well as ancillary services. Financial derivatives may be over the counter Electric Forwards and Options or Exchange Traded Products

A.5.2 ERCOT Congestion Revenue Rights (CRRs) Transaction Limits

CRR transaction limits under development

A.5.3 Physical or Financial Natural Gas Transaction Limits

Title	Term	Lead Time	Transaction Size (MMBTU/day)
City Council	No Limit	No Limit	No Max
City Manager	≤ 1 Years	≤ 3 Years	45,000
DME General Manager	≤ 1 Year	≤ 2 Years	45,000
Market Operations Manager	≤ 1 Month	≤ 12 Month	45,000
Senior Energy Market Operator	≤ 1 Week	≤ 12 Month	45,000
Energy Market Operator	≤ 1 Day	≤ 1 Day	45,000

Notes:

- Natural Gas transactions limited to the following locations: Henry hub or locations within Texas
- Authorized products include natural gas, including both physical and financial derivatives. Financial derivatives may be over the counter Gas Futures and Options or Exchange Traded Products

The need for natural gas services other than commodity purchases to support the Denton Energy Center (e.g., natural gas storage and transportation services) is currently under review. If needed, transaction limits to cover these services will be added to this appendix as part of Phase 2.

A.5.4 Renewable Energy Credit Transaction Limits

Title	Per Transaction Limits (up to)		
	Vintage	Volume	\$/REC
City Council	No Limit	No Limit	No Max
City Manager	≤ 2 Years	<u>1,200,000</u>	No Max
DME General Manager	≤ 1 Year	<u>600,000</u>	No Max
Market Operations Manager	≤ 3 Month Month to Quarter	<u>300,000</u>	No Max
Senior Energy Market Operator	≤ 1 Week Day Ahead to balance of week	<u>N/A</u>	N/A
Energy Market Operator	≤ 1 Day Hourly to balance of day	<u>N/A</u>	N/A

The need for trading additional energy-related products, such as carbon offsets, emissions allowances and weather derivatives is currently under review. If needed, transaction limits to cover these services will be added to this appendix as part of Phase 2.

Appendix B DEFINITIONS

Participation in physical and financial energy markets has the potential to expose DME to the risks of cost and pricing uncertainty, revenue and commodity market volatility, and difficulty in meeting budgeted cash flow targets. The following section provides descriptions of the energy-related risks the Policy is intended to address.

BASIS RISK

Basis risk is the difference between the index used in a financial hedge versus the physical commodity being hedged. For example, if a company hedged future purchases of natural gas with an index based on the price of natural gas at a certain delivery point, a risk would exist that the price of natural gas delivered to the company would go up and the price of natural gas at the financial delivery point would not.

CREDIT RISK

Credit risk is the risk that a counterparty to a transaction may be unable or unwilling to fulfill its present and future obligations; i.e. perform on a sale or purchase agreement. The potential for unrealized gains or losses may accrue in physical contracts prior to actual delivery obligation.

The creditworthiness of counterparties is a function of different factors affecting the credit rating assigned to a counterparty by major credit rating services or an internal evaluation of the counterparty's financial strength. Factors include future market values and credit variables (i.e. price level, price differentials, volatility, correlation, default rates, etc.) that affect earnings, cash flows, and fair values. The credit standing of an existing or potential counterparty may be established from its credit rating (published by one of the commonly recognized rating agencies), market intelligence, electronic news releases, or other public information sources.

Managing credit exposure is an important component in bilateral over-the-counter (OTC) energy transactions. Some practices in managing credit exposure:

- Establish appropriate measures of counterparty creditworthiness such as financial strength, market presence, extent and location of generation assets, performance history, and contracting terms.
- Set a minimum credit standard or criteria for counterparties based on DME's requirements for the above measures.
- Apply the criteria to potential counterparties and develop a list of pre-approved counterparties.
- Require letters of credit or other acceptable collateral from counterparties who do not meet the criteria.
- Engage in bilateral transactions with *only* pre-approved counterparties who meet or exceed

the criteria.

The potential financial impact from a counterparty default could be significant. However, it is believed that Section 3.4 of this Policy provides an effective mechanism to appropriately and effectively manage such risk.

LIQUIDITY RISK

Liquidity risk is the uncertainty of DME's potential performance due to the inability to transact at expected market prices. From the Front Office perspective, liquidity is the ease with which a trader can enter or exit a financial position without impacting price. An illiquid market is a market where few transactions occur and large bid-ask spreads persist for long periods of time.

From a Middle Office perspective, liquidity is the uncertainty of DME's potential performance due to a shortage of cash and available lines of credit in the event of a large collateral call by ERCOT or a bilateral trading partner or due to a large trading loss. Key drivers of liquidity risk are the size of DME's energy commodity position, the contract tenor, price volatility and the ability to maintain a solid credit rating.

MARKET PRICE RISK

Market Risk is the uncertainty of DME's potential performance due to volatile commodity market prices (i.e. price risk). The potential for market risk is inherent in DME's operations due to the financial impact of variable energy commodities, ancillary service prices and potentially related financial variables. Variability in any of these parameters has the potential to cause volatility in expenses, customer rates, and revenues as well as the value of energy-based assets and liabilities.

To protect itself from electricity or fuel market price spikes, this Policy authorizes DME to participate in the energy markets described in Appendix E to manage its energy portfolio proactively, seizing upon opportunities to limit energy commodity risk and produce additional revenues. The electricity and natural gas markets contain numerous opportunities to stabilize prices through forward transactions.

MODEL RISK

Model Risk is the uncertainty of DME's performance due to potentially inaccurate or incomplete characterization of a transaction or portfolio elements due to fundamental deficiencies in models and/or information systems.

OPERATIONAL AND VOLUMETRIC RISKS

Operational risk is the risk that not enough resources are available to meet DME customer load requirements. Volumetric risk is risk that energy commodity purchases fail to exactly match

requirements, creating an unplanned net long or short position. These risks are managed by a series of accepted industry practices, including the following:

- Electric supply risk is managed by maintaining adequate planning resource margins and operating reserves;
- Fuel supply risk is managed by owning or contracting for storage services and maintaining fuel supply inventories to assure continued operations under most potential shortage conditions;
- Taking the opportunity to stabilize costs through forward “seasonal transactions”

Operational risk of extreme load conditions and resource or transmission outages are not specifically addressed in this Policy. The importance of an accurate load/resource balance forecast and the ability to react to contingencies and to minimize volumetric risk are to be handled through DME’s standard operating procedures.

ORGANIZATIONAL RISK

Organizational risk is the risk of unclear lines of responsibility and accountability and the lack of adequate controls to ensure effective implementation of this Policy. However, overly burdensome or restrictive controls or restraints that render a process ineffective in its ability to make timely decisions can also result in organizational risk. This risk is believed to be minimal as organizational and oversight responsibilities and expectations are clearly delineated throughout this Policy.

OUTAGE RISK

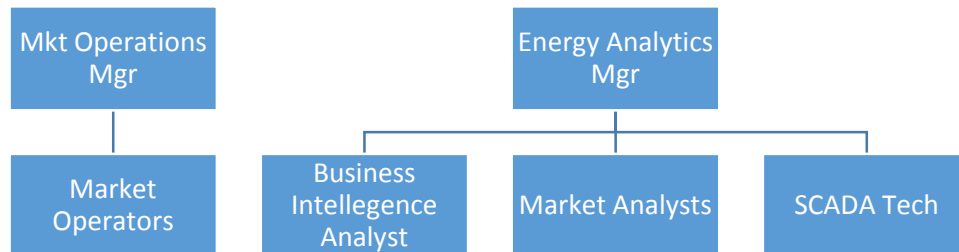
Outage risk is the uncertainty of DME’s performance due to uncertainty in the availability, forced outage frequency, and/or planned outage scheduling and duration of DME’s generating facilities (including those in which DME has partial ownership or contractual entitlements).

REGULATORY RISK

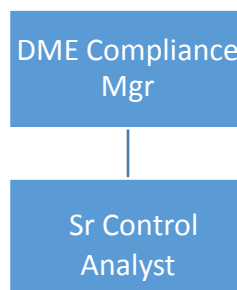
Regulatory risk is the uncertainty of DME’s performance due to potential change in laws and / or regulations.

Appendix C ORGANIZATIONAL STRUCTURE

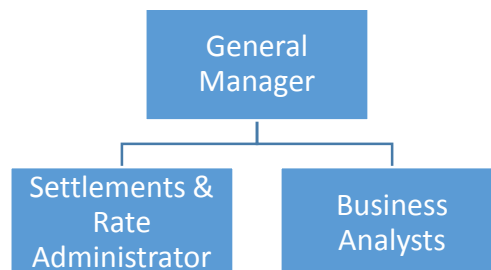
Energy Management Organization Front Office



Energy Management Organization Middle Office



Energy Management Organization Back Office



Appendix D APPROVED TRANSACTION TYPES

Products allowed for energy management activities include the purchase and sale of electric energy, ancillary services, ERCOT Congestion Revenue Rights, Renewable Energy Credits and natural gas (commodity). The RMC is responsible for authorizing all products and commodity types as further detailed in the EMO Procedures Manual.

All transactions must follow certain requirements as described throughout this Policy. Key elements include:

- All transactions must be committed to by authorized transacting personnel
- All transactions must be with approved counterparties
- All transactions must be with counterparties with adequate available credit
- All transactions must be committed over recorded phone lines or via electronic mail
- All transactions must be approved transaction types
- All transactions must be consistent with this Policy and the EMO Procedures Manual

Failure to observe the above minimum requirements when executing energy transaction is a violation of Policy and is subject to disciplinary action.

Authorized Markets

The EMO is authorized to transact in the following markets

- ERCOT Physical and Financial Power
- Physical Natural Gas at locations within Texas
- Financial Natural Gas
 - New York Mercantile Exchange (NYMEX)
 - Henry Hub
 - Locations in Texas
 - Natural Gas Contracts traded Over-the-Counter (OTC)
 - NYMEX ClearPort
 - Intercontinental Exchange (ICE)
- Natural Gas Exchange (NGX) Renewable Energy Credits
- Weather Derivatives

POWER TRANSACTIONS

Power transactions shall be limited to delivery or exposure to power within ERCOT.

1. Physical
 - a. Fixed-price purchases and sales
 - b. Index-price purchases and sales
 - c. Fixed-price forward block purchases and sales (e.g., Peak Weekday, Peak Weekend, Nights)
 - d. Forward block purchases and sales with price indexed to natural gas
 - e. Spot purchases and sales through Day-Ahead or Real Time markets, Commodity Exchanges or bilateral contracts
 - f. Call Options
 - g. Put Options
 - h. Ancillary services
2. Financial
 - a. Fixed for floating price swaps
 - b. Exchange traded or OTC Call options
 - c. Exchange or OTC Put options
 - d. Ancillary Services
 - e. ERCOT Congestion Revenue Rights (CRRs)

NATURAL GAS TRANSACTIONS

Natural Gas transactions shall be limited to exposure to Henry Hub or a location within Texas

1. Physical Gas which may be needed to support operation of the Denton Energy Center
 - a. Natural Gas commodity
 - b. Natural Gas transportation
 - c. Natural Gas storage
2. Financial
 - a. Exchange traded futures
 - b. Exchange traded or OTC Call options
 - c. Exchange traded or OTC Put options
 - d. Index options

Other authorized energy-related commodity transactions

Energy Risk Management Policy

1. Renewable Energy Credits (RECs) associated with energy that has already been generated within the last 3 years. Not allowed are RECs associated with energy that will be generated at some future point in time.2014-060
2. Weather Derivatives

Appendix E ENERGY RISK MANAGEMENT POLICY ACKNOWLEDGEMENT FORM

The purpose of this form is to confirm that City of Denton employees involved with the Energy Portfolio Management program have received, read, and understand DME's Energy Risk Management Policy.

Employee Name: _____

Title: _____

Department: _____

Supervisor: _____

My signature below confirms that I have received, read and understand DME's Energy Risk Management Policy and appendices, and the City of Denton policies regarding employee conduct.

Signature of Employee

Date