

Statewide Energy Assessment – (SEA) Final Outline – March 5, 2019

I. Executive Summary

II. Introduction

- A. Governor's request: Review the supply, engineering, deliverability, and consumption of Michigan's natural gas, electricity and propane.
- B. Overarching goal: Ensure public health and safety by mitigating risks of energy supply or delivery disruptions due to equipment failure, extreme weather, security threats, and other factors, and limit impacts and plan for recovery of an energy emergency should one occur.
- C. Impetus
 - 1. Extreme weather event – polar vortex
 - 2. Unplanned equipment failure
 - 3. Need to evaluate system vulnerabilities and energy emergency preparedness
 - 4. Ongoing threat of cyber or physical security breaches
- D. Scope of Assessment (per Governor Whitmer's letter)
 - 1. The Commission's current infrastructure planning criteria and methodologies concerning distribution, transmission, and generation (including contingency plans);
 - 2. Existing planning processes for electric and natural gas utilities and best practices for integration;
 - 3. Linkages and gaps between real-time operational reliability and infrastructure planning for long-term reliability;
 - 4. Demand response and mutual assurance protocols by natural gas utilities and opportunities for enhancement;
 - 5. Contingency risks, interdependencies, and vulnerabilities of supply and/or delivery disruptions from physical and/or cyber security threats as well as a projected cost estimate of potential enhancements;
 - 6. Adequacy of Commission rules addressing customer safety, reliability and resiliency, and utility notifications;
 - 7. Evaluation of the existing gas efficiency program; and
 - 8. Identification of areas or types of systems most at risk.
- E. Evaluation/Recommendation
 - 1. By July 1, 2019, complete initial report evaluating if the electric/natural gas/propane systems are adequate to account for changing system conditions and extreme weather events and identifying recommendations to mitigate risk and ensure safety and reliable energy, including public communications.
 - 2. Upon the final report, the Commission should direct the utilities to take appropriate action to address any shortfalls highlighted in the report including but not limited to recommendations concerning changes to energy planning criteria and approaches, regulatory review, and proposed oversight improvements.

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III. Michigan's Energy System: Facing today's and tomorrow's challenges

- A. Overview of Michigan's Energy System.
- B. Michigan's unique strengths - gas storage; access to electricity and gas markets; gas transmission capacity; Ludington pumped storage station; diversity in power supplies; propane storage capacity and proximity to Sarnia; Ontario fractionator/refinery; electric demand response capabilities.
- C. Changing landscape of risks
 - 1. Inclement weather, storm intensity and frequency
 - 2. Fuel procurement and gas supply availability
 - a. Generation diversity and interdependencies
 - b. Fuel supply sourcing and supply chain
 - 3. Physical and cyber security
 - 4. Clean energy requirements, goals, and commitments
 - a. Legislative targets
 - i. Renewable Energy (RE): PA 342
 - ii. Electric and Gas Energy Waste Reduction (EWR): PA 342
 - iii. Demand Response (DR): DR Framework
 - b. Utility targets and carbon emission reduction commitments
 - c. Impact on infrastructure needs
 - d. Effects on resilience and reliability
 - 5. Adequacy of MPSC rules and best practices related to customer safety, reliability, and resilience; customer notifications

IV. Electric

- A. System Overview and Operational Practices
 - 1. Generation/Transmission (bulk power system)
 - a. Resource Adequacy
 - b. North American Electric Reliability Corporation (NERC) Standards
 - c. Regional transmission organization (RTO) day-ahead/real-time – security constrained economic dispatch; emergency declaration levels and actions (including role of demand response)
 - d. Activities related to electric and natural gas coordination, particularly enhanced coordination between the RTO and natural gas industry
 - 2. Distribution
 - a. MPSC Rules – Technical, Service Quality, and Customer Protection Standards, etc.
 - b. Distribution outage preparedness and response activities
 - c. Equipment failures and response
 - d. Technologies and distribution management practices that could affect system operations, reliability and resiliency
- B. Regulatory Oversight of Energy Planning and Infrastructure
 - 1. Generation

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- a. Renewable mandate, Integrated Resource Plan (IRP) and Certificate of Necessity (CON)
 - b. Capacity requirements and demonstrations – MPSC and RTOs
 - c. Infrastructure and operations and maintenance (O&M) expense prudence reviews through rate proceedings
 - d. Review of fuel supplies and purchased power arrangements to meet customer demand in Power Supply Cost Recovery proceedings
2. Transmission
 - a. Reliability and economic planning by transmission owners and at RTO level; planning criteria and RTO review role
 - b. Transmission siting/certificate of public convenience and necessity (CPCN) determinations
 3. Distribution
 - a. 5-year infrastructure and maintenance plans
 - b. Infrastructure and O&M expense prudence reviews through rate proceedings
- C. Vulnerabilities
1. Aging distribution infrastructure
 2. Transmission Interconnections
 3. Generation shift in supply and operational considerations across multiple timeframes and seasons
 4. Potential loss of major generating station
 5. Interdependencies with natural gas home heating
- D. Risk Assessment
1. Infrastructure
 - a. Asset conditions and performance
 - b. Interconnection limitations or constraints
 - c. Visibility and controls (e.g., Supervisory Control and Data Acquisition (SCADA))
 2. Investment trends and projections
 - a. Capital investments
 - i. Historical investments by type
 - ii. Projected investments by type
 - b. Operations and Maintenance
 - c. Clean energy requirements and drivers; emerging energy technologies
 - d. Potential impacts of investments and timing of recovery on reliability, operations, and energy supply and delivery risks
 3. Adequacy of MPSC rules and best practices related to customer safety, reliability, and resilience; customer notifications
- E. Contingency Planning Methodologies and Assumptions
1. Resource adequacy – Loss of load expectation

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2. Electric transmission – NERC/RTO standards and transmission owner planning criteria
3. Electric distribution – Risk-based planning models
4. Load forecasting methodologies and risks
 - a. Evaluation of energy efficiency programs on consumption and peak demand
 - b. Changing customer behavior and technology adoption (e.g., electric vehicles) and forecasting risks
5. Available mutual aid from regional/national utility resources

V. Natural Gas

A. System Overview and Operational Practices

1. Gas technical and safety standards
 - a. Performance-based and prescriptive standards
 - b. Onsite facility and operational inspections
 - c. Accident investigation and compliance actions
 - d. Interstate inspections
2. Storage facility operations

B. Regulatory Oversight of Energy Planning and Infrastructure

1. Natural gas system planning
 - a. Storage
 - b. Compression
 - c. Transmission
 - d. Distribution
2. Infrastructure and O&M expense prudence reviews through rate proceedings
3. Review of supply arrangements to meet customer demand and redundancy in Gas Cost Recovery proceedings

C. Vulnerabilities

1. System limitations
2. Infrastructure failures
3. Interconnections
4. System redundancy
5. Single source supplies

D. Risk Assessment

1. Infrastructure
 - a. Asset conditions and performance
 - b. Interconnection limitations or constraints
 - c. Visibility and controls (e.g., SCADA)
2. Investment trends and projections
 - a. Capital investments
 - b. Historical investments by type
 - c. Projected investments by type

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- d. Operations and Maintenance
- e. Clean energy requirements and drivers; emerging energy technologies
- f. Potential impacts of investments and timing of recovery on reliability, operations, and energy supply and delivery risks
- 3. Adequacy of MPSC rules and best practices related to customer safety, reliability, and resilience; customer notifications
- E. Contingency Planning Methodologies and Assumptions
 - 1. Transmission
 - a. Distribution interconnections
 - b. Intrastate interconnections
 - c. Interstate interconnections
 - d. Peak design day
 - e. Contingency considerations
 - f. Effectiveness of modeling
 - 2. Distribution
 - a. Planning and modeling
 - b. Contingency considerations
 - c. Effectiveness of modeling
 - 3. Load forecasting methodologies and risks
 - a. Evaluation of energy efficiency programs on consumption and peak demand
 - b. Changing customer behavior and technology adoption (e.g., electric vehicles) and forecasting risks

VI. Propane

- A. System Overview and Operational Structure
 - 1. Production
 - 2. Transportation
 - a. Rail
 - b. Truck
 - c. Pipeline
 - 3. Storage
- B. Limited Regulatory Oversight of Propane Market
 - 1. Propane pipeline siting authority
 - 2. Safety oversight of hazardous liquid pipelines
 - 3. Transportation regulations
 - a. Rail
 - b. Truck
 - 4. Price – Attorney General and Price Monitoring
 - 5. Storage operations
 - a. Underground cavern
 - b. Aboveground bulk tanks

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- c. Customer
- C. Unique Strengths
 1. In-State storage capacity
 2. Infrastructure
 3. Market access diversity
 4. Market size
- D. Vulnerabilities
 1. Driver shortages
 2. Infrastructure availability
 3. Export markets
 4. Un-Regulated marketplace
- E. Risk Assessment
 1. Infrastructure
 2. Investment trends and projections
 - a. Propane industry mergers and acquisitions
- F. Contingency Planning Methodologies and Assumptions
 1. National and regional coordination of supply monitoring and waiver requests
 2. Public education and awareness
 3. Access to Appalachian basin resources

VII. Cyber and Physical Security

- A. Background
 1. History
 2. Current threat landscape
- B. Sector Response
 1. Standards
 2. Partnerships
 3. Investments
 4. Mutual aid
- C. Principal Sector Risks
 1. Field equipment security
 - a. Cyber
 - b. Physical
 2. Human capital
 3. Third party risk
 4. Disparate policies and procedures
 5. Insider risk
- D. Risk Register
 1. Register primer, methodology
 2. Summary (recommendations)

VIII. Energy Emergency Management

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- A. Nature of Energy Emergencies
- B. Statutory Authorities Addressing Energy Emergencies Including Waivers
 - 1. PA 191
 - 2. PA 390
 - 3. Federal Motor Carrier Safety Administration (FMCSA) and US Environmental Protection Agency (EPA) regulations
 - 4. Michigan Air Quality regulations
- C. Roles and Responsibilities
 - 1. Overview
 - 2. MPSC
 - a. Emergency communications plans
 - b. Emergency management training and exercises
 - 3. State
 - a. State Police
 - b. Other departments
 - c. Governor
 - 4. Federal
- D. Energy Emergency Procedures
 - 1. General Info
 - a. Energy Emergency Phases
 - b. Utility Notification Procedures
 - c. Vulnerable Customers/Populations
 - 2. Utility mitigative measures
 - a. Electric emergency and curtailment procedures
 - i. Capacity shortages
 - ii. Demand Response
 - iii. Natural gas (fuel) emergency curtailment
 - iv. RTO alerts and procedures
 - b. Natural gas emergency and curtailment procedures
 - i. Transmission
 - ii. Distribution
 - 3. Petroleum Shortage Response Plan
 - a. Overview
 - b. Supply management measures
 - c. Demand restraint measures
 - d. Emergency waivers
- E. Ongoing Projects
 - 1. Coordination with local emergency managers
 - 2. Critical infrastructure assessment
 - 3. Petroleum backup readiness
 - a. Terminals
 - b. Fueling stations

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4. Lifeline sector restoration prioritization

IX. Gaps in Existing Planning, Operational, and Emergency Response Processes

- A. Gaps in existing planning, operational and emergency response processes that may create safety, reliability, and resiliency challenges. Examples:
 1. Seasonal capacity construct at regional level
 2. Better integration of gas and electric planning functions recognizing interdependencies
 3. Work with Midcontinent Independent System Operation (MISO) and Federal Energy Regulatory Commission (FERC) to better align RTO retirement study process and generation interconnection queue process to be more nimble
 4. Long-term gas storage, transmission, and distribution infrastructure and maintenance plans requirement for distribution plans
 5. Role of emerging technologies to improve reliability and resiliency, e.g., energy storage, microgrids
 6. Redundancy in upstream natural gas capacity
- B. Areas for improvement, opportunities for enhancement, and rough cost estimates

X. Conclusions and Recommendations

- A. System adequacy to account for changing conditions and extreme weather events
- B. Recommendations to mitigate risk and ensure safe, reliable energy
- C. Directive(s) to utilities for appropriate actions to address shortfalls

XI. Appendices/References