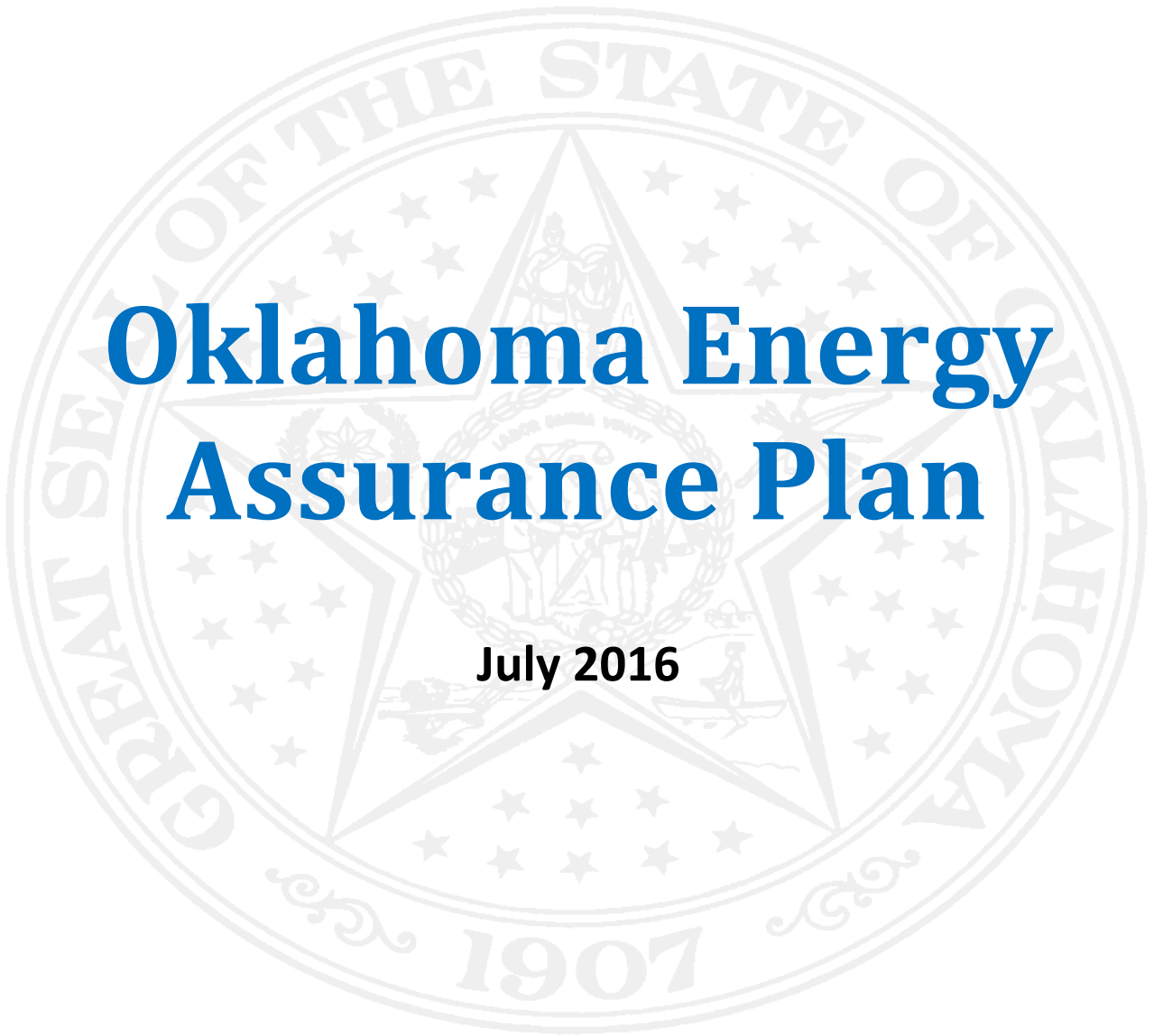


The background of the page features a large, faint, circular seal of the State of Oklahoma. The seal contains a five-pointed star in the center, surrounded by smaller stars. The outer ring of the seal reads "GREAT SEAL OF THE STATE OF OKLAHOMA" and the year "1907" is at the bottom. The text "Oklahoma Energy Assurance Plan" is overlaid on the seal in a bold, blue font.

Oklahoma Energy Assurance Plan

July 2016

This material is based upon work supported by the United States Department of Energy under Award Number *DE-EE-0006219*.

Disclaimer: This report was prepared as an account of work sponsored by an agency of the United States Government. Neither the United States Government nor any agency thereof, nor any of their employees, makes any warranty, express or implied, or assumes any legal liability or responsibility for the accuracy, completeness, or usefulness of any information, apparatus, product, or process disclosed, or represents that its use would not infringe privately-owned rights. Reference herein to any specific commercial product, process, or service by trade name, trademark, manufacturer, or other does not necessarily constitute or imply its endorsement, recommendation, or favoring by the United States Government or any agency thereof. The views and opinions of authors expressed herein do not necessarily state or reflect those of the United States Government or any agency thereof.

CONTENTS

CONTENTS.....	3
PERIODIC REVIEW AND CHECK-OFF	7
ACKNOWLEDGEMENTS.....	8
EXECUTIVE SUMMARY	9
INTRODUCTION	11
PURPOSE OF THE PLAN	11
CONTENTS OF THE PLAN	12
ENERGY ASSURANCE PLANNING OVERVIEW	14
IDENTIFYING AND CATEGORIZING ENERGY EMERGENCIES	14
<u>Types and Potential Causes of Energy Emergencies</u>	14
<u>Levels of Energy Shortage</u>	15
ENERGY ASSURANCE AND THE PHASES OF EMERGENCY MANAGEMENT	16
MONITORING ENERGY SUPPLY AND DEMAND	18
<u>General Information</u>	18
<u>Monitoring Electricity</u>	19
<u>Monitoring Natural Gas</u>	20
<u>Monitoring Petroleum</u>	20
LEGAL AUTHORITY	21
<u>State Authority</u>	21
<u>Federal Authority</u>	22
<u>Local Authority</u>	23
ENERGY PROFILE FOR OKLAHOMA	25
BACKGROUND AND OVERVIEW	25
ELECTRICITY PROFILE	27
<u>Electricity Providers in Oklahoma</u>	29
<u>Energy Efficiency for Electricity</u>	39
<u>Renewable Energy for Electricity</u>	40
PETROLEUM PROFILE	43

<u>Crude Oil Producers in Oklahoma</u>	43
<u>Crude Oil/Petroleum Industry Oversight</u>	46
<u>Industry Stakeholders</u>	47
NATURAL GAS PROFILE	48
<u>Natural Gas Providers in Oklahoma</u>	49
<u>Inter- and Intrastate Transportation of Natural Gas</u>	52
<u>Trade Associations</u>	55
<u>Energy Efficiency for Natural Gas</u>	55
<u>Compressed Natural Gas for Transportation</u>	55
COAL PROFILE	57
PROPANE PROFILE	58
ENERGY VULNERABILITY ASSESSMENTS	59
Historical Analysis of Energy Emergencies in Oklahoma	59
Infrastructure Vulnerabilities by Energy Source	63
<u>Electric Infrastructure Vulnerabilities</u>	63
<u>Natural Gas Infrastructure Vulnerabilities</u>	64
<u>Crude Oil and Petroleum Products Infrastructure Vulnerabilities</u>	65
Cybersecurity Planning	66
<u>Cybersecurity Measures in the Electric Sector</u>	68
<u>Cybersecurity Measures in the Natural Gas Sector</u>	70
<u>Cybersecurity Measures in the Telecommunications Sector</u>	72
<u>Response and Communication after Cyber Events</u>	73
<u>Regional Transmission Organizations</u>	73
Sector Interdependencies	74
ENERGY EMERGENCY RESPONSIBILITIES	77
PUBLIC SECTOR STAKEHOLDERS	77
<u>State Agencies</u>	77
<u>Local Agencies</u>	82
<u>Federal Agencies</u>	82
ENERGY EMERGENCY COMMUNICATIONS PROCEDURES	86
INTERNAL COMMUNICATIONS	86
EXTERNAL COMMUNICATIONS	89
<u>State Information Flow</u>	89

<u>Alternative Outlets for Information Flow</u>	89
<u>Communications Integration</u>	90
<u>Concept of Operations</u>	90
<u>Resource Requirements</u>	91
<u>Direction and Control</u>	91
MITIGATING, TRACKING, AND RESPONDING TO ENERGY EMERGENCIES	92
ELECTRICITY	92
<u>Preparation and Preventative Measures</u>	92
<u>Mitigation Measures and Restoration of Electric Power After Interruptions</u>	94
CRUDE OIL AND PETROLEUM PRODUCTS	98
<u>Preparation and Preventative Measures</u>	98
<u>Mitigation Measures after Supply Interruptions</u>	100
NATURAL GAS	101
<u>Preparation and Preventative Measures</u>	101
<u>Mitigation Measures After Supply Interruptions</u>	102
CONCLUSION	106
Appendix A: Supply Disruption Tracking	107
Electric Sector Supply Tracking	107
Natural Gas Sector Supply Tracking	108
Petroleum Sector Supply Tracking	108
Appendix B: Cooperatives Serving Oklahoma	109
Appendix C: Public Compressed Natural Gas Fueling Station Locations	110
Electricity Emergency Response Menu	123
Petroleum Emergency Response Menu	132
Natural Gas Emergency Response Menu	138
Appendix E: Sperry-Piltz Ice Accumulation Index	142
Appendix F: Implementation Actions	143
Issuing Waivers from Federal Motor Carrier Safety Regulations in an Energy Emergency	143
Requesting a Fuels Waiver	148

This page left intentionally blank

PERIODIC REVIEW AND CHECK-OFF

An annual review of this plan should be conducted to update contact information, law and rule changes, and energy-related data. At least at each five-year interval after the original plan's publication, consideration should be given to a full plan update and rewrite.

DATE

_____ April _____	, 2013
_____ June _____	, 2014
_____ June _____	, 2015
_____ June _____	, 2016
_____	, 2017
_____	, 2018
_____	, 2019
_____	, 2020
_____	, 2021
_____	, 2022

ACKNOWLEDGEMENTS

The Oklahoma State Energy Office, part of the Office of the Oklahoma Secretary of Energy & Environment, would like to thank the Oklahoma Corporation Commission's Public Utility Division and the University of Oklahoma's National Institute for Risk and Resilience and Center for Risk and Crisis Management for their assistance in drafting this Plan, which can be found online at <http://www.occeweb.com/pu/PUD%20Reports%20Page/pudreports.html>.

Many other stakeholders also gave their time and expertise during the drafting process. In particular, the following groups were instrumental in providing information for or feedback on the Plan:

AEP-Public Service Company of Oklahoma

Association of Central Oklahoma Governments

CenterPoint Energy

Geo-Energy Services

Grand River Dam Authority

National Association of State Energy Officials (NASEO)

Oklahoma Association of Electric Cooperatives

Oklahoma Corporation Commission

- *Oil and Gas Division*
- *Petroleum Storage Tank Division*
- *Pipeline Safety Department*

Oklahoma Gas & Electric Company

Oklahoma Natural Gas Company

Western Farmers Electric Cooperative

EXECUTIVE SUMMARY

The State of Oklahoma is rich in energy resources, from natural gas to crude oil and from wind to hydro and geothermal energy. These resources, coupled with access to and purchases of coal and electricity produced in other states, provide energy for 3.7 million Oklahoma residents¹, more than 300,000 companies and businesses, and over 3.5 million vehicles. With this demand for energy comes a responsibility for energy assurance planning for and ensuring a reliable energy supply for the State, and planning for and responding when energy disruptions and emergencies occur.

Each year, Oklahoma faces a variety of energy disruptions. Most of these are limited in scope, but some extend over wider areas, impact large segments of the population, or can last for long periods, threatening the life, health, and welfare of Oklahoma residents and creating energy emergencies that are complex and vary in cause, form, duration, and severity. As of 2016, Oklahoma is the third most-disaster prone state in the nation, as measured by the number of Disaster Declarations issued each year.² Given the number of disasters occurring in Oklahoma, their potential scope and public risk, planning for and responding to energy emergencies in the State of Oklahoma requires careful, coordinated action and makes a State Energy Assurance Plan critical.

Government is charged with ensuring the safety and well-being of its citizens. In Oklahoma, energy assurance is a subset of the overall state emergency preparedness. To address emergencies of all types, Oklahoma has an Emergency Operations Plan (“EOP”) that provides, in cooperation with local and federal government and volunteer service organizations, a system to mitigate against, prepare for, respond to, and recover from the effects of national security incidents and natural and technological hazards affecting the State. The EOP is maintained by the Oklahoma Department of Emergency Management (“OEM”) and defines the roles of local, State and federal governmental entities in providing disaster relief and assistance. It also contains 15 “annexes” or the framework through which responsibilities are assigned to identified state agencies and volunteer service organizations to coordinate and execute common emergency management strategies during specific types of emergencies. The Energy Annex, Emergency Support Function-12 outlines energy emergency responsibilities.

The document below, the Oklahoma Energy Assurance Plan (“EAP” or “Plan”), is intended to complement the State’s official EOP Energy Annex by providing detailed background information about Oklahoma’s energy landscape. The EAP provides a detailed description of how Oklahoma currently plans for, prevents and responds to energy emergencies, and a menu of strategies for officials and stakeholders to consider as they attempt to prevent or manage these emergencies. The

¹ United States Census Bureau, *Quick Facts Oklahoma*, <https://www.census.gov/quickfacts/table/PST045215/40> (June 22, 2016).

² Federal Emergency Management Agency, *Disaster Declarations by State/Tribal Government*, <http://www.fema.gov/disasters/grid/state-tribal-government> (June 1, 2016).

Plan provides standard definitions for categorizing energy emergencies, by type and severity, and provides a framework for delineating phases of energy emergency response. It also provides reference information to assist officials in closely monitoring conditions affecting energy supply and demand statewide and nationwide. In addition, the Plan outlines the legal authorities granted to the various levels of government — federal, state and local — that are responsible for all phases of energy assurance.

After providing an overall framework, the EAP profiles each of Oklahoma’s major energy sectors — electricity, petroleum, natural gas, coal and propane — including through production and consumption information and a description of infrastructure under management and programs administered.

Next, the Plan assesses the State’s energy vulnerabilities by analyzing the history of energy disruptions in Oklahoma. It then discusses potential infrastructure vulnerabilities in the various energy sectors and interdependencies that energy assurance planning should consider, as these may affect recovery efforts during emergencies.

After detailing Oklahoma’s energy landscape, the EAP describes the responsibilities of various governmental agencies in responding to an energy emergency. In particular, it discusses communication procedures between and across governmental agencies during energy emergencies and explains how public information must be disseminated to citizens of Oklahoma during such events.

The final section of the Plan focuses on the specific response strategies for energy disruptions and emergencies. This includes preventative strategies and measures to mitigate the impact of an emergency prior to its occurrence, and second, detailed supply and demand response options for officials to consider during an energy emergency, and cybersecurity planning.

The Plan is intended for use by all governmental agencies, energy suppliers, and key service providers who have responsibilities or essential capabilities for responding to energy emergencies. The Plan is meant to serve as a guide rather than a list of “one-size-fits-all” procedures. In particular, the latter portion of the Plan, which suggests potential responses to an energy emergency, should be treated as a “menu” of response options, from which to select and implement, rather than a list of standard operating procedures. While this Plan attempts to address the most common types of energy emergencies that Oklahoma may experience and outlines a wide variety of possible response measures, the document does not claim to provide an exhaustive review of every potential cause of emergency or every potential remedy.

The Oklahoma State Energy Office, located within the Office of the Secretary of Energy and Environment, maintains coordination responsibility for Oklahoma’s EAP. Questions and comments about this Plan can be directed at any time to Kylah McNabb at (405) 522-7226 or Kylah.McNabb@ee.ok.gov.

INTRODUCTION

PURPOSE OF THE PLAN

During any given year, the State of Oklahoma faces a variety of energy disruptions. The vast majority of these disruptions are limited in scope and quickly addressed by energy providers. As such, they are barely newsworthy. Sometimes, however, energy disruptions extend over wider areas, impact large segments of the population, or can last for long periods, threatening the life, health, and welfare of Oklahoma residents. For instance, in December 2007, Oklahoma experienced one of the most disruptive ice storms in State history. An estimated 600,000 Oklahoma homes and businesses were without electricity for several days — many for a week or more. The Oklahoma State Medical Examiner’s Office reported 29 storm-related fatalities. Several of these fatalities were directly attributable to power outages.

Such energy emergencies are highly complex and come in many forms, from power blackouts and pipeline explosions to petroleum shortages. Causes of energy emergencies also vary. These can range from spikes in consumer demand during peak energy use, unplanned power plant or refinery shutdowns, transmission system congestion, and severe weather. So, planning for and responding to energy emergencies in the State of Oklahoma often require coordinated government action.

To address emergencies of all types, the State of Oklahoma has an Emergency Operations Plan (“EOP”)³ that provides, in cooperation with local and federal government and volunteer service organizations, a system to mitigate against, prepare for, respond to, and recover from effects of national security incidents and natural and technological hazards affecting the State. The Oklahoma Department of Emergency Management (“OEM”) maintains the EOP. This plan defines the roles of local, state and federal governmental entities in providing disaster relief and assistance. It also contains 15 “annexes, which are Emergency Support Functions (“ESFs”) that assign responsibility to identified state agencies/departments and volunteer service organizations during specific types of emergencies—energy emergency responsibilities are outlined in Emergency Support Function-12.

The document below, the EAP, is intended to complement the State’s official Emergency Operations Plan, Energy Annex (Emergency Support Function 12) by providing background information about Oklahoma’s energy landscape, a detailed description of how Oklahoma currently prevents and responds to energy emergencies, and a menu of strategies for officials and

³ A complete copy of Oklahoma’s EOP can be found at http://www.ok.gov/OEM/Programs_&_Services/Planning/State_Emergency_Operations_Plan_-_EOP.html.

stakeholders to consider as they attempt to prevent and manage those emergencies. The EAP is intended for use by all governmental agencies, energy suppliers, and key service providers who have responsibilities or essential capabilities for responding to energy emergencies. The Plan is meant to serve as a guide rather than a list of “one-size-fits-all” procedures that can be applied generically without regard for the unique circumstances surrounding each emergency. In particular, the latter portion of the Plan, which suggests potential responses to an energy emergency, should be treated as a “menu” of response options from which to select and implement, rather than a list of standard operating procedures.

Oklahoma’s EAP was drafted in a collaborative effort between public agencies and private stakeholders. More information about those involved in the writing of this document can be found on Page 7, the “Acknowledgements” page.

For this Plan to be an effective tool, close communication among government agencies and between the agencies and private sector stakeholders is critical. Many of these communications channels are in place and are noted in the appropriate sections of the Plan. In other cases, communications channels are less formal but critical to maintain to facilitate an effective response if emergencies should arise. Key governmental contacts for energy emergency response are maintained by OEM, by the Oklahoma Corporation Commission (“OCC” or “Commission”), the Oklahoma State Energy Office, and through a password-protected website hosted by the U.S. Department of Energy. Detailed energy industry contact lists are required to be provided to the State annually by all regulated energy companies, and are maintained by the Public Information Officer of the OCC.

To ensure the Plan remains up to date and functional as an emergency planning document, each year, at a minimum, the contact list and data portions of the Plan should be reviewed and updated by the Oklahoma State Energy Office. Changes will be noted on the update log on Page 6.

The Oklahoma State Energy Office, located within the Office of the Secretary of Energy and Environment, maintains coordination responsibility for Oklahoma’s Energy Assurance Plan. Questions and comments about this plan can be directed at any time to Kylah McNabb at (405) 522-7226 or Kylah.McNabb@ee.ok.gov.

CONTENTS OF THE PLAN

With the previous discussion in mind, the following sections comprise the Energy Assurance Plan for the State of Oklahoma.

First, the Plan sets the stage for energy assurance planners in Oklahoma. It provides standard definitions for categorizing energy emergencies, both in type and severity, and provides a framework for delineating phases of energy emergency response. It also provides reference information to assist officials in closely monitoring the conditions affecting energy supply and

demand statewide, regionally, and nationwide. In addition, this section outlines the legal authorities granted to the various levels of government — federal, state and local — that are responsible for all phases of energy assurance, which are as follows: 1) Monitor and Alert; 2) Assess and Determine Action; 3) Actions and Feedback; and 4) review Lessons Learned. .

After providing the framework for energy assurance planning, the EAP profiles each of Oklahoma’s major energy sectors—electricity, petroleum, natural gas, coal and propane — through information on energy production and consumption and description of infrastructure under management and programs administered.

Next, the Plan provides an assessment of Oklahoma’s energy vulnerabilities by analyzing historical events in Oklahoma that have caused energy disruptions. It then discusses potential infrastructure vulnerabilities in the various energy sectors and interdependencies that should be considered in energy planning activities, as these may affect recovery efforts during emergencies.

The Plan then turns to a detailed description of the duties of the various governmental agencies that have responsibilities in the event of an energy emergency.

The Energy Emergency Communications Procedures section of the Plan discusses procedures for communications between and across governmental agencies during energy emergencies, as well as how public information must be disseminated to citizens of Oklahoma during such emergencies.

The final section of the Plan focuses on specific response strategies, including preventative strategies and measures to mitigate impacts of a potential emergency and a detailed menu of supply and demand response options for officials to consider should an energy emergency impact the State. This section also discusses cybersecurity planning.

ENERGY ASSURANCE PLANNING

OVERVIEW

IDENTIFYING AND CATEGORIZING ENERGY EMERGENCIES

Energy emergencies come in many forms, but most can be categorized as either service interruptions or supply shortages. Though we often treat these two types of emergencies as if they were mutually exclusive, it is important to recognize that one type of emergency can lead to another or they can both occur simultaneously. For example, significant supply shortages can lead to service interruptions.

Types and Potential Causes of Energy Emergencies

Service Interruptions

Sometimes when energy service is interrupted, public demand for energy cannot be met at any price. Generally, damage to local distribution infrastructure causes this type of emergency. Accordingly, response measures usually involve repairing the damaged infrastructure. In all but the most extreme instances, governmental response to a service interruption is limited because energy companies are responsible for repairing their own systems. As such, the government's role is often one of support rather than direct action.

Although many variables can lead to infrastructure damage, some of the most common causes of damage to local energy infrastructure in Oklahoma include inclement weather (lightning, wind, tornadoes, ice, flooding, drought, etc.), earthquakes, accidents, or mechanical failure due to faulty or aging transmission or distribution lines.

Supply Shortages

In other instances, an energy emergency can be a supply shortage. Petroleum and natural gas shortages typify this kind of emergency. During such emergencies, energy supplies become insufficient or too expensive to meet public demand. Whereas the solution to service interruptions often requires local infrastructure repair, responses to supply shortages generally involve increasing supply or decreasing demand. In such instances, state officials often play a more significant role, by encouraging consumption reductions or temporarily lifting wellhead restrictions on the production of natural gas.

The list of variables that could cause a supply shortage is also quite lengthy. For organizational purposes, they can be divided into two categories — causes that limit the energy supply and causes that stimulate an abnormal demand spike. Factors that might limit energy supply include major infrastructure damage, like a pipeline explosion or natural disasters that impair refineries

such as tornadoes and ice storms, railway damage, or unsuitable driving conditions; and/or international events that radically increase the price or curtail the energy supplies from abroad. Variables that could cause demand spikes include , prolonged periods of abnormally hot or cold weather that triggers a surge electricity demand, or crisis events that strike general public fear and uncertainty that causes them to stock-up on fuel and other resources.

Levels of Energy Shortage

Efforts to respond to an energy emergency must correspond with the severity of the crisis. In other words, state officials must consider the seriousness of the emergency prior to selecting and implementing appropriate response measures. For conceptual purposes, we draw from National Association of State Energy Officials (“NASEO”) guidelines⁴ to define four levels of energy shortages. These levels are intended to be broad guidelines, as shown below, which illustrate the fact that shortages differ with regard to severity. In reality, the severity of each energy emergency is multidimensional and requires a qualitative assessment prior to categorization. This qualitative assessment should analyze the number of meters affected, the vulnerability of the affected population, and the circumstances surrounding the incident. For instance, a short electrical outage during an extremely cold winter day can be more severe than a sustained outage in the fall or spring.

Level 1: Normal Conditions

- No discernable shortage

Level 2: Mild Shortage

- 5-10% reduction in petroleum supply for a week or more
- 5-10% reduction in natural gas nominations
- Localized infrastructure damage causing short-term electric transmission/distribution interruptions
- **No immediate threat to public health, safety, welfare, and/or economic vitality**

Level 3: Moderate Shortage

- 10-15% reduction in petroleum products for three weeks or more
- 10-15% reduction in natural gas nominations
- Curtailments by local gas distribution companies for two weeks or more
- Moderate infrastructure damage causing widespread electric transmission/distribution interruptions
- **Situation threatens to disrupt or diminish public health, safety, welfare, and/or economic vitality**

⁴ NASEO, *State Energy Assurance Guidelines*, <http://www.naseo.org/eaguidelines/> (June 7, 2016).

Level 4: Severe Shortage

- Greater than 15% reduction in the availability of petroleum products and/ or natural gas for more than two weeks
- Severe drops in natural gas nominations or other production problems
- Severe infrastructure damage causing widespread interruptions in electric transmission/distribution that extend for several weeks
- **Situation poses an immediate threat to public health, safety, welfare, and/or economic vitality**

Again, classifying an emergency as one level or another is as much a matter of qualitative judgment as it is a matter of quantitative or objective definition. Likewise, movement from one level to another is not necessarily linear or incremental. There are cases where conditions can escalate from normal or mild to severe in a matter of hours.

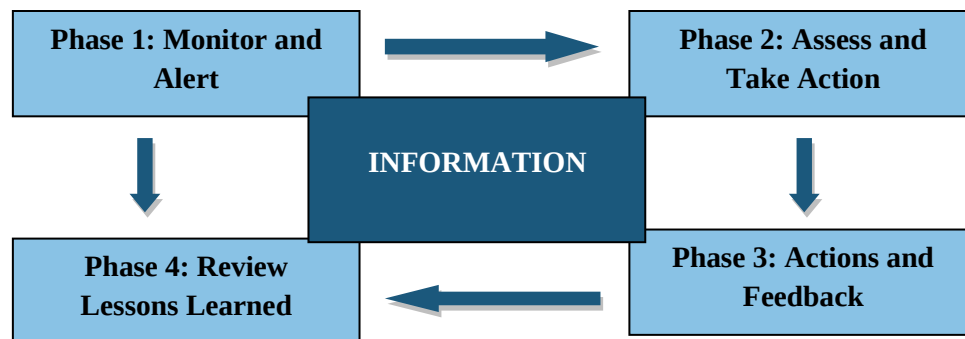
ENERGY ASSURANCE AND THE PHASES OF EMERGENCY MANAGEMENT

In managing complex and potentially catastrophic emergencies, governmental officials must look beyond the traditional idea of emergency response planning. Emergency response planning is predominantly reactive toward energy assurance as a whole, which incorporates a number of proactive and preemptive actions designed to prepare for emergencies, mitigate their potential impact, and learn from them by considering results of actions taken.

As defined by the U.S. Department of Energy (“DOE”), energy assurance involves a vast array of activities that fall into three main categories: prepare and plan, mitigate and respond, and educate and outreach. Preparation and planning involve identifying key assets and points of contact, designing and updating energy emergency response plans, training personnel, and conducting exercises that test the effectiveness of response plans. Mitigation and response activities include monitoring events that may affect energy supplies, assessing the disruptions’ severity, providing situational awareness, coordinating restoration efforts, and tracking recoveries. Education and outreach activities include communicating and coordinating with key stakeholders, increasing public awareness, and forming partnerships across sectors and jurisdictions.

With this definition in mind, NASEO suggests that energy assurance include the four phases depicted in Figure 1. In the early phases, government action revolves around preparedness and mitigation. In the later phases, governmental action involves responding to and recovering from the energy emergency, as well as learning from the event itself. As a critical background to each phase, the agencies charged with responding to an emergency must have as much information as possible, which enables an up-to-date understanding of the situation on the ground, an in-depth understanding of the energy profile in Oklahoma, a detailed familiarity with critical infrastructure and potential vulnerabilities, as well as a keen awareness of state history and previous events. All of this information should be carefully considered when making key decisions during each of the four phases of emergency management.

Figure 1: The Four Phases of Energy Assurance



Phase I: Monitor and Alert

Phase I involves the ongoing monitoring of energy supplies, public demand, and prices. During this phase, State agencies monitor data and information continuously as it becomes available through energy supply reporting systems, paying attention to supply and distribution problems.

Phase II: Assess and Determine Action

In Phase II, having noticed early signs indicating a potential energy emergency, governmental agencies intensify their data and information collection efforts to ensure that they have the best and most recent information. This data is used to evaluate the severity of the potential emergency, to locate the population that is likely to be influenced, and to determine whether governmental action is necessary.

Phase III: Actions and Feedback

If the government decides action is needed to ensure Oklahoma citizens' health, welfare, and safety, and the continued economic vitality of the State, Phase III activity begins. Governmental actions during Phase III, which is sometimes referred to as the "response" phase, include:

- Increasing the level of communication among state agencies and the public,
- Convening emergency planning and response organizations to consider actions that might be taken by the various state departments and agencies,
- Implementing voluntary programs to maximize the availability of energy supplies and/or programs designed to reduce existing demand,
- If the problem involves multiple states, share information among state energy coordinators,
- If implementation of voluntary programs or other emergency deterrent actions fail to mitigate the emergency, take additional actions,
- If the situation continues to deteriorate, recommend a "State of Energy Emergency" be declared by the Governor, which will enable advanced response measures and activate requests for and access to federal assistance, if necessary,
- Continued monitoring of energy supply and demand to determine if governmental action has been effective.

Phase IV: Review Lessons Learned

As emergency operations are phased out, state agencies thoroughly evaluate their actions and report the results to interested parties, such as the Governor's Office, cabinet level officers, legislative committees and energy policy councils. These evaluations should include:

- Reports describing the nature of the energy emergency and a chronology of the actions taken to respond to it,
- An evaluation of the different response measures taken, with a specific focus on effectiveness and timeliness,
- A critical review of the overall performance of the state's energy assurance plan in addressing that particular emergency.

MONITORING ENERGY SUPPLY AND DEMAND

The information sources below provide reliable information for energy planners that can be used to monitor or predict energy supplies or situations that may occur. By maintaining an understanding of energy markets and environmental conditions, State planners and responders will be better prepared to address shortage or emergency situations that may arise. A full discussion of Oklahoma's supply disruption tracking system is found in *Appendix A*.

In addition to these general sources of information, Oklahoma has five designated Energy Emergency Assurance Coordinators who receive regular updates regarding energy security issues, daily news summaries, emergency situation reports, lessons learned from other states, and links to outage and curtailment information. This password-protected site is maintained and administered by the U.S. DOE's Office of Electricity Delivery and Energy Reliability. A full discussion of the role of Oklahoma's Energy Emergency Assurance Coordinators can be found in the Communications Section of this Plan.

General Information

U.S. Energy Information Administration

(<http://www.eia.gov>)

Provides a wide range of information and data covering energy production, inventories, demand, imports, exports, and prices; and prepares analyses and special reports on topics of current interest.

Monthly Energy Review

(<http://www.eia.gov/totalenergy/data/monthly/index.cfm>)

A monthly publication containing recent energy statistics and information, including about total energy production, consumption, and trade; energy prices; overviews of petroleum, natural gas, coal, electricity, nuclear energy, renewable energy, and international petroleum; carbon dioxide emissions; and data unit conversion values.

Energy Assurance Daily

(<http://www.oe.netl.doe.gov/ead.aspx>)

Provides a summary of public information concerning current energy issues. It is published Monday through Friday to inform stakeholders of developments affecting energy systems, flows, and markets. It provides highlights of energy issues, including coverage of major energy developments in the electricity, petroleum, and natural gas industries; energy prices; and other relevant news.

Emergency Situation Reports

(http://www.oe.netl.doe.gov/emergency_sit_rpt.aspx)

Contains impact studies on the disruption of energy infrastructure caused by disasters such as hurricanes, a regional power blackout, wildfires, etc

NOAA

(http://www.cpc.ncep.noaa.gov/products/analysis_monitoring/cdus/degree_days/)

The National Weather Service and National Oceanic and Atmospheric Administration (“NOAA”) provides data on cooling and heating degree days that can be helpful to development of forecasts of extreme weather conditions that create peak loads on the electrical generation system or increases in demand for gas for space heating.

National Weather Center

(<http://www.ou.edu/nwc>)

The University of Oklahoma hosts the National Weather Center, which is a unique partnership of University of Oklahoma, NOAA and state organizations that work together to improve understanding of events in Earth’s atmosphere over a wide range of time and space. The National Weather Center has played a key role in weather forecasting during previous Oklahoma emergencies and remains a valuable local resource.

Monitoring Electricity

Electric Power Monthly

(<http://www.eia.gov/electricity/monthly/index.cfm>)

Monthly report on electricity sales and electricity production, by state, month, sector, and power generation fuel.

Quarterly Coal Report

(<http://www.eia.gov/coal/index.cfm>)

Quarterly report that lists the amount of coal consumed in each state and prices paid by each sector. It also estimates levels of fuel inventories by utility and reports the number of days of fuel supply on hand at each location for coal- and oil-fired plants.

Regional System Reliability Forecast

(<http://www.nerc.com/pa/RAPA/Pages/default.aspx>)

The North American Electric Reliability Corporation (NERC) publishes annual reports of regional system reliability that assess regional reserve margins by comparing net system availability with peak load projections and system-pool reserve availability.

Electric Emergency Incident and Disturbance Report

(<http://www.oe.netl.doe.gov/oe417.aspx>)

Provides information on electric emergency incidents and disturbances. Used by the Department of Energy to fulfill its overall national security and other energy emergency management responsibilities, as well as for analytical purposes.

Monitoring Natural Gas

Natural Gas Monthly

(http://www.eia.doe.gov/oil_gas/natural_gas/data_publications/natural_gas_monthly/ngm.html)

Provides data on natural gas production, supply, consumption, disposition, storage, imports, exports, and prices in the United States. The report is published by state, month, and sector.

CNGNow

(<http://www.cngnow.com>)

Provides nationwide information on locations and prices for Compressed Natural Gas for use as a vehicle fuel.

U.S. Department of Transportation, Pipeline & Hazardous Materials Safety Administration (PHMSA)

(<http://www.phmsa.dot.gov/pipeline/library/data-stats/pipelineincidenttrends>)

Provides information, by state, on pipeline incidents that may affect supply.

Monitoring Petroleum

EIA Reports

(<http://www.eia.gov/petroleum/reports.cfm?t=214>)

The EIA collects and analyzes data on petroleum prices, inventories, and demand. Reports are available on a weekly, monthly, and yearly basis.

American Petroleum Institute

(<http://www.api.org/products-and-services/statistics>)

The API publishes information on the average pump price for gasoline, state motor fuel tax rates, and U.S. oil and petroleum product imports by country.

Federal Highway Administration

(<http://www.fhwa.dot.gov/policyinformation/quickfinddata/qffuel.cfm>)

The FHA publishes data, monthly and annually, on motor fuel usage across the United States.

GasBuddy

(<http://www.gasbuddy.com>)

Provides information on the lowest available price of gasoline and diesel fuel by city and state.

LEGAL AUTHORITY

This portion of the Energy Assurance Plan identifies the primary sources of legal authority for response to an emergency in the State of Oklahoma.

State Authority

Oklahoma Emergency Management Act (63 O.S. § 683.1-683.24)

This 2003 law replaced the Oklahoma Civil Defense and Emergency Resources Management Act of 1967 as the primary state law detailing emergency management in Oklahoma. It declared the policy of Oklahoma to be that all emergency management and hazard mitigation functions of the State are to be coordinated to the maximum extent with comparable functions of the federal government, other states and localities, and private agencies, to the end that the most effective preparation and use may be made of the available workforce, resources and facilities for dealing with disaster and hazard mitigation. Each State agency, board, commission, department or other State entity having responsibilities indicated in the State Emergency Operations Plan must have written plans and procedures to protect individual employees, administrators and visitors from natural and man-made disasters and emergencies that may occur at the work place. All such plans and procedures are made in cooperation with the OEM, which is responsible for establishing a guidebook entitled “Emergency Standard Operating Procedures”. Each State agency, board, commission, department or other State entity must provide an annual report on the status of its emergency management program to OEM. OEM then must compile and integrate all reports into a report to the Governor and Legislature on the status of State emergency preparedness.

Oklahoma Emergency Response Act (27A O.S. § 4-1-101 – 4-1-106)

The purpose of this 1993 Act is to provide a rapid, coordinated and effective network for necessary response to dangerous substance incidents or events to protect the public health and safety of this State and to preserve property. It also seeks to provide direction and information to responders for the management of dangerous substance incidents or events and to reduce duplication of effort between local, county, and State entities. Finally, the Act seeks to organize, prepare and coordinate across Oklahoma all available manpower, materials, supplies, equipment, facilities and services necessary for a response to a dangerous substance incident.

Oklahoma Emergency Price Stabilization Act (15 O.S. § 777.1 – 777.5)

In 1999, Oklahoma enacted the Oklahoma Price Stabilization Act to prevent unwarranted price increases for goods and services in the wake of a disaster in the State. Once the Governor or President has declared a state of emergency, the Act prohibits prices from being raised more than 10% above pre-emergency levels in the covered area. Violators can face up to a year in prison and a fine of up to \$1,000, as well as other penalties of up to \$10,000 and restitution.

Oklahoma Homeland Security Act (74 O.S. § 51 – 51.3)

The Oklahoma Homeland Security Act was established to respond to acts of terrorism that may occur in the State. The Act created the Oklahoma Office of Homeland Security (“OKOHS”) and

established the position of Homeland Security Director to head the Office. The Governor is appointed as the State's chief counterterrorism official and places administrative responsibility on the director. Among other things, the OKOHS is tasked with developing, coordinating, implementing, and administering a comprehensive state plan for responding to events such as acts of terrorism, public health emergencies, cyberterrorism, or incidents involving weapons of mass destruction. Likewise, the Act designates the OKOHS as the agency responsible for developing interoperable public safety communications planning for the State.

Federal Authority

Homeland Security Presidential Directive 5 (“HSPD-5”)

This directive enhances the ability of the United States to manage domestic incidents by establishing a single, comprehensive National Incident Management System (NIMS). It requires all federal departments and agencies to cooperate with the Secretary of Homeland Security by providing their full and prompt cooperation, resources, and support as appropriate and consistent with their own responsibilities for protecting the nation's security. This action also directed the development of the National Response Framework (NRF), which was established to align federal coordination structures, capabilities, and resources into a unified, all-discipline, and all-hazards approach to domestic incident management. Additionally, the NRF directs that state, local and tribal governments and non-governmental organizations use NRF-established incident reporting protocols modify existing plans to ensure alignment with the NRF, and notify the Secretary of Homeland Security of any substantial conflicts between the NRF and state or tribal government laws or regulation.

Presidential Policy Directive 21 -- Critical Infrastructure Security and Resilience (“PPD-21”)

Issued in February 2013, this directive revokes Homeland Security Presidential Directive 7 (HSPD-7) and establishes a national policy on critical infrastructure security and resilience, structured around three strategic imperatives: 1) to refine and clarify functional relationships across the federal government to advance the national unity of effort to strengthen critical infrastructure security and resilience; 2) to enable effective information exchange by identifying baseline data and systems requirements for the federal government; and 3) to implement an integration and analysis function to inform planning and operations decisions regarding critical infrastructure. The directive requires the Secretary of Homeland Security to: develop by June 2013 a description of the functional relationships within Department of Homeland Security (“DHS”) and across the federal government related to critical infrastructure security and resilience; analyze by July 2013 the existing public-private partnership model and recommend options for improving the effectiveness of the partnership in physical locations and cyberspace; convene a team of experts to identify by August 2013 baseline data and systems requirements to enable the efficient exchange of information and intelligence relevant to strengthening the security and resilience of critical infrastructure; demonstrate by October 2013 a near real-time situational awareness capability for critical infrastructure; create by October 2013 a successor to the National Infrastructure Protection Plan that addresses the implementation of PPD-21, the

requirements of Title II of the Homeland Security Act of 2002 as amended, and alignment with the National Preparedness Goal and System required by PPD-8; and by February 2015 create a National Critical Infrastructure Security and Resilience R&D Plan that takes into account the evolving threat landscape, annual metrics, and other relevant information to identify priorities and guide R&D requirements and investments.

Robert T. Stafford Disaster Relief and Emergency Assistance Act (“Stafford Act”)

The Federal Emergency Management Agency (“FEMA”), following a presidential declaration of an emergency or a major disaster, provides assistance and may require other federal agencies to provide resources and personnel to support state and local emergency and disaster assistance efforts. Requests for a presidential declaration of an emergency or major disaster must be made by the governor of the affected state based on a finding by that governor that the situation is of such severity and magnitude that effective response is beyond the capabilities of the state. DOE supports DHS/FEMA relief efforts by assisting federal, state, and local government and industry with their efforts to restore energy systems in disaster areas. When necessary, DOE also may deploy response staff to disaster sites. DOE is the lead agency directing Emergency Support Function-12 (Energy), which assists the restoration of energy systems and provides an initial point-of-contact for the activation and deployment of DOE resources. These activities are performed pursuant to the Stafford Act and HSPD-5 (Management of Domestic Incidents) and National Response Plan (“NRP”).

A thorough listing of federal acts, authorizations, and references can be found in Appendix C of the State Energy Assurance Guidelines developed by the National Association of State Energy Officials (“NASEO”) (Version 3.1, December 2009).⁵

Local Authority

Oklahoma statutes, at 63 O.S. § 683.11, require that all incorporated jurisdictions in the State develop emergency management programs. County jurisdictions are also required to have a qualified emergency management director. A complete list of these emergency management directors can be found on the OEM’s website.⁶ Any incorporated municipality must either have its own emergency management director or create an agreement with the county for emergency management services. These emergency management organizations must develop local emergency operations plans that include preparedness, response, recovery and mitigation. These plans must be based on a hazard and risk assessment. Finally, the statutes require that localities coordinate their plans with State-level officials.

⁵ National Association of State Energy Officials, *State Energy Assurance Guidelines*, <http://www.naseo.org/eaguidelines/> (June 7, 2016).

⁶ Oklahoma Department of Emergency Management, *Oklahoma Emergency Management Directors*, <http://www.ok.gov/OEM/documents/012011localem.pdf> (June 7, 2016).

In the case that an emergency occurs that is too great for the locality to deal with unassisted, Oklahoma statute also provides for local emergency management directors to enter into mutual aid agreements for reciprocal emergency management aid and assistance. Localities may work with other public or private agencies in the state, and if granted approval by the governor, work with emergency management organizations in bordering states.

ENERGY PROFILE FOR OKLAHOMA

This section of the Plan provides a summary description of Oklahoma's energy use and expenditures to familiarize officials with the relative risk for each energy sector during an energy incident. This section also provides a brief look at critical energy infrastructure to help officials focus on potential vulnerabilities. A more detailed list of critical energy infrastructure is available in a supplementary document that is classified for security purposes. For purposes of organization, this section begins with a brief summary of energy supply and demand in Oklahoma and then breaks out each energy sector into individual subsections.

BACKGROUND AND OVERVIEW

Oklahoma is home to abundant energy resources. Significant oil and natural gas fields can be found in Oklahoma's Anadarko, Arkoma, and Ardmore geologic basins, and small coal deposits lie in the Arkoma Basin and the Cherokee Platform, both in eastern Oklahoma. Oklahoma also has hydroelectric potential in several river basins, as well as wind and solar potential, especially in the western portion of the state.

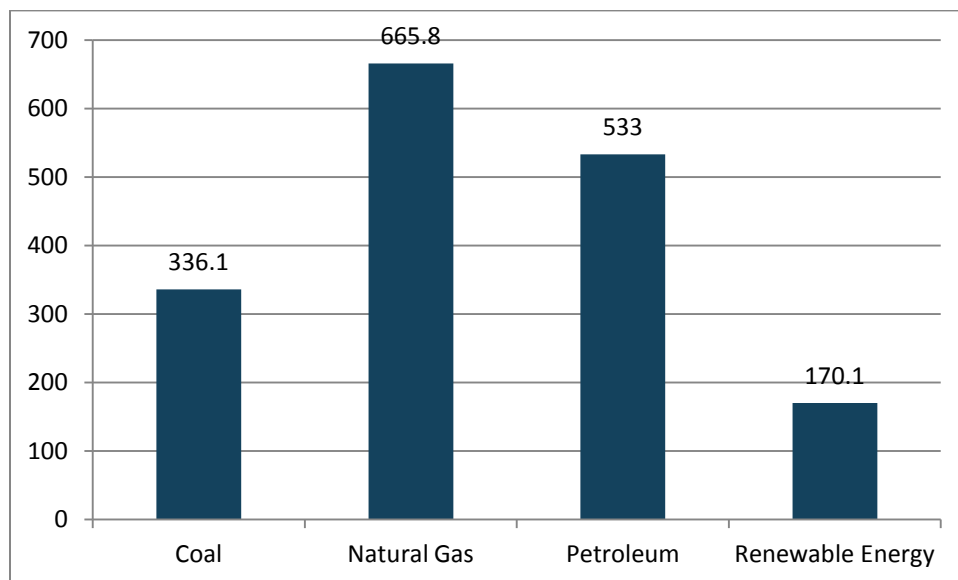
Oklahoma's economy is deeply connected with the oil and gas industry. In the 20th century, several oil and gas exploration and production booms produced periods of sustained economic development in Oklahoma. Although production from the Oklahoma oil and gas industry has declined over several decades since its peak 1927 and a record high in 1990 the industry remains a considerable source of employment and revenue, in part because in 1992, the Oklahoma State Legislature created the Commission on Marginally Producing Oil and Gas Wells, which helps operators sustain production from marginally producing wells. Oklahoma has experienced production increases in 2014 and 2015

In recent years, technological advancements in oil and natural gas extraction and the production of wind energy have increased the energy potential of the State. In natural gas, for example, innovations such as horizontal drilling and increased hydraulic fracturing have allowed Oklahoma companies to access previously untapped resources. However, the increase in supply has driven down natural gas prices over time. Likewise, improvements in turbine technology have induced energy companies to invest more in wind resources, which has increased the percentage of power that the State receives from renewable resources.

In 2014, Oklahomans consumed approximately 433 million Btu of energy per capita, which ranked 10th in the U.S. In total, this amounted to 1,705 trillion Btu of energy consumed in the State, when accounting for consumption minus 34.1 trillion Btu of net interstate flow of electricity. Oklahoma's higher-than-average per capita energy consumption is due in part to the State's energy-intensive oil and gas industry. It is also due in part to Oklahoma's natural

climate, which can bring extreme heat in the summer and cold in the winter, driving up the need for indoor heating and cooling in residences and businesses.

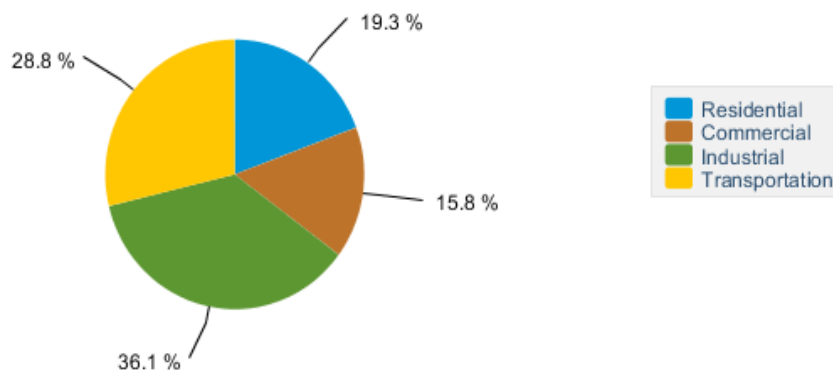
Figure 2: Oklahoma Energy Consumption by Fuel Source, 2014 (trillion Btu)



Source: U.S. Energy Information Administration, Energy Consumption Overview: Estimates by Energy Source and End-Use Sector, 2014, http://www.eia.gov/state/seds/sep_sum/html/pdf/sum_btu_1.pdf (June 21, 2016).

By sector, Oklahoma's industrial sector is the heaviest energy user, consuming 606 trillion Btu in 2014, or approximately 36% of the State total. By comparison, the transportation sector consumed about 28%, the residential sector consumed approximately 19%, and the commercial sector consumed approximately 16% of the State's energy total (see Figure 3).

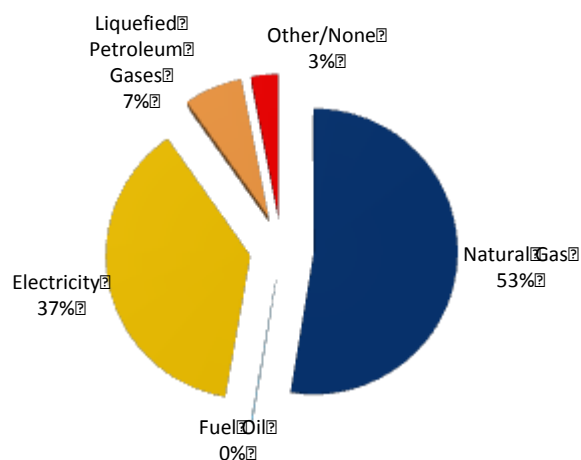
Figure 3: Oklahoma Energy Consumption by End-Use Sector, 2014 (trillion Btu)



Source: U.S. Energy Information Administration, Oklahoma State Profile and Energy Estimates, <http://www.eia.gov/state/?sid=OK#tabs-2> (May 31, 2016).

Analysis of residential consumption by heating source shows approximately 53% of Oklahoma homes are heated by natural gas, approximately 37% by electricity, and approximately 7% by liquefied petroleum gases, and just 0.1 % rely on fuel oil (see Figure 4).

Figure 4: Oklahoma Home Heating Source, 2014



Source: U.S. Energy Information Administration, *Oklahoma State Profile and Energy Estimates*, <https://www.eia.gov/state/print.cfm?sid=OK> (May 31, 2016).

ELECTRICITY PROFILE

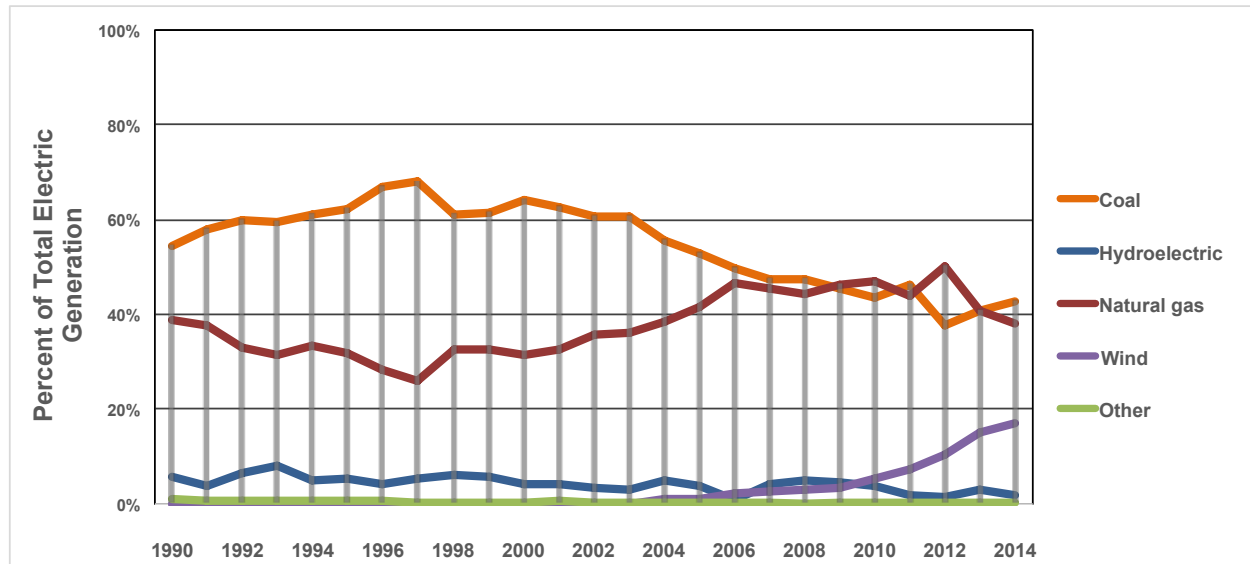
Overall, Oklahoma's electricity generation capacity and consumption trend toward national averages. As shown in Table 1 below, the State's electric power industry had a net summer generation capacity of 24,048 MW of electricity in 2014 and a net generation of 70,155,504 MWh, most of which comes from electric utilities, ranking Oklahoma 17th and 22nd in these respective categories as compared to other U.S. states. As a rough indication of demand, total retail sales were 61,573,374 MWh in 2014, accounting for approximately 87% of the total electricity generated. In this indicator of demand, Oklahoma ranks 25th in the nation, which is the national average. However, one aspect of Oklahoma's electric sector diverges from the State's trend toward national averages. Electricity in Oklahoma is relatively inexpensive — in 2014 the average price of electricity per kWh was \$0.0818, which ranks 43rd in the United States.

Table 1: Oklahoma Electricity Summary Profile, 2014

Item	Value	U.S. Rank
Net Summer Capacity (megawatts)	24,048	17
<i>Electric Utilities</i>	17,045	17
<i>Independent Power Producers & Combined Heat and Power</i>	7,003	16
Net Generation (megawatt hours)	70,155,504	22
<i>Electric Utilities</i>	48,096,026	19
<i>Independent Power Producers & Combined Heat and Power</i>	22,059,478	14
Total Retail Sales (megawatt hours)	61,573,374	25
<i>Full Service Provider Sales (megawatt hours)</i>	61,573,374	20
Direct Use (megawatt hours)	1,255,974	22
Average Retail Price (cents/kWh)	8.18	43
KWh = Kilowatt hour. Source: U.S. Energy Information Administration, <i>Table 1: 2014 Summary Statistics</i> , http://www.eia.gov/electricity/state/oklahoma/ (June 1, 2016).		

In Oklahoma, coal- and natural gas-fired power plants dominate electric power production, although renewable energy from wind power accounts for a growing percentage. Coal-fired facilities mainly receive their coal via railcar from Wyoming, while plants fueled by natural gas often source their fuel from within Oklahoma. In the past, coal was the majority fuel source for electric generation in Oklahoma. More recently, natural gas has grown to be nearly equal in its contribution as a fuel source. For instance, in 2001, coal powered 62.7% of electric generation, natural gas fueled only 32.5%, and other energy sources, including wind and hydro, fueled less than 5% of the state's electricity generation. However, as shown in Figure 5, as of 2014, natural gas powers 38% of kilowatt hours generated in Oklahoma, only slightly below the percentage of kilowatt hours generated from coal. The next highest source, wind, was responsible for fueling approximately 17% of the kilowatt-hours generated in the State.

Figure 5: Electric Power Industry Generation by Primary Energy Source, 1990-2014



Source: U.S. Energy Information Administration, *Oklahoma Electricity Profile 2014*, <http://www.eia.gov/electricity/state/Oklahoma/> (June 1, 2016).

Seven major electric generation suppliers operate in the State. Of these, six own and/or operate electric generation facilities, or portions of generation facilities within the borders of Oklahoma. The seventh serves customers within the State but has no generation facilities here.⁷ Three of the seven are investor-owned utilities (“IOUs”), two are generation and transmission cooperatives, and two are public sector utilities.

Electricity Providers in Oklahoma

Investor-Owned Utilities

The three IOU electric utilities that provide retail service to most of the State, and which are regulated by the State, are:

- Oklahoma Gas and Electric Company
- Public Service Company of Oklahoma
- The Empire District Electric Company

Oklahoma Gas & Electric

Oklahoma Gas and Electric Company (“OG&E”) is the largest provider of electricity in Oklahoma in terms of number of customers served. It provides electric service to about 828,000 customers and has approximately 6,771 megawatts of generating capacity. OG&E owns seven power generation plants and three wind farms. This utility utilizes coal to generate 49% of its

⁷ Oklahoma Corporation Commission, *State of Oklahoma 13th Electric System Planning Report: June 2015*, http://www.occeweb.com/pu/PUD%20Reports%20Page/13th2015_ESPR.pdf (June 21, 2016).

kilowatt hours produced, natural gas for 44%, and wind for 7%.⁸ OG&E's electric transmission and distribution systems cover an area of 30,000 square miles.⁹ Table 2 and Figure 6 below show OG&E's owned generation facilities by fuel type, capacity and location. In addition to these owned facilities, OG&E also purchases electricity from other companies, such as from the independent AES Shady Point, LLC generation facility near Poteau, Oklahoma, which generates electricity exclusively using Oklahoma coal.

Table 2: OG&E-Owned Generation Sources¹⁰

Facility Name	Location	Generating Capacity
Horseshoe Lake (gas)	Oklahoma City	891 MW
McClain (gas)	Newcastle	380 MW*
Muskogee (coal)	Muskogee	1,510 MW
Mustang (gas)	Oklahoma City	439 MW
Redbud (gas)	Luther	622 MW*
Seminole (gas)	Seminole	1,438 MW
Sooner (coal)	Red Rock	1,042 MW
Centennial (wind)	Harper	120 MW
OU Spirit (wind)	Woodward	101 MW
Crossroads (wind)	Dewey	228 MW

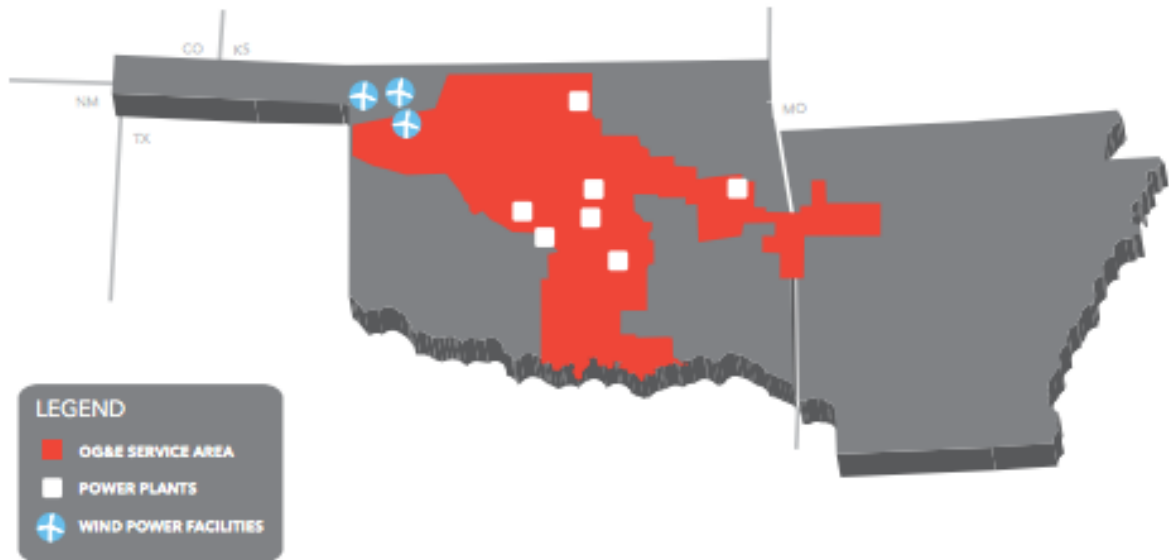
*Co-owned. Capacity listed is OG&E-owned generation capacity.

⁸ The percentages of fuels utilized for hours of generation may differ from the percentages of those fuels in a utility's overall generating capacity due to fluctuating prices of various fuel sources.

⁹ Oklahoma Gas & Electric Company, *Company Profile, Investor Fact Sheet—May 2016*, <http://phx.corporate-ir.net/External.File?file=3Fitem%3DUGFyZW50SUQ9MzIzMzF8Q2hpbGRJRd0tMXxUeXBIPtM%3D%26t%3D1&usq=AFQjCNHfh6AGpd5xrmn2DHmAI45KOhCRqA> (June 1, 2016).

¹⁰ Oklahoma Gas & Electric Company's December 31, 2015 10 K Report (see page 40).

Figure 6: OG&E Regional Asset Map



Source: Oklahoma Gas & Electric Company, *Company Profile, Investor Fact Sheet—May 2016*, <http://phx.corporate-ir.net/External.File?item%3DUGFyZW50SUQ9MzIzMzF8Q2hpbGRJR0tMXxUeXBIPtM%3D%26t%3D1&usq=AFQjCNHfh6AGpd5xrmn2DHmAI45KOhCRqA> (June 1, 2016).

Public Service Company of Oklahoma

Public Service Company of Oklahoma (“PSO”), which is a unit of American Electric Power (“AEP”), is the second-largest provider of electricity in Oklahoma, serving approximately 542,000 customers in the State, mostly in eastern and southwestern areas. PSO has a generation capacity of 4,256 megawatts within the State. PSO’s generation capacity by fuel mix includes 35% coal, 15% natural gas, 12% wind purchased under long-term contracts, and 38% other purchased power.¹¹ PSO has 3,384 miles of transmission lines and 22,212 miles of distribution lines in Oklahoma. The table below and Table 3 show PSO’s generation sources by fuel type, location and capacity, and Figure 7 displays the service territory.

¹¹ PSO Fact Sheet 2015, https://www.psoklahoma.com/global/utilities/lib/docs/info/facts/factsheets/PSO_Fact_Sheet_2015.pdf, (June 22, 2016).

Table 3: PSO-Owned Generation Facilities

Facility Name	Location	Generating Capacity
Tulsa Power Station (natural gas)	Tulsa	319 MW
Northeastern Station, Units 1&2 (natural gas)	Oologah	856 MW
Northeastern Station, Units 3&4 (coal)	Oologah	936 MW
Riverside (natural gas)	Jenks	1,059 MW
Comanche (natural gas)	Lawton	225 MW
Weleetka (natural gas)	Weleetka	150 MW
Southwestern Station (natural gas)	Anadarko	609 MW
Oklunion (coal)	Vernon, TX	102 MW*

*Co-owned. Capacity listed is PSO-owned generation capacity.

Figure 7: PSO Service Territory Map



Source: Public Service Company of Oklahoma, *Service Territory*, https://www.aep.com/investors/eventspresentationsandwebcasts/documents/2015_EEI_Factbook.pdf (June 1, 2016).

The Empire District Electric Company

The Empire District Electric Company (“EDE”) is an investor-owned public utility operating in Arkansas, Kansas, Missouri, and Oklahoma. It is headquartered in Joplin, Missouri. EDE provides service to 4,700 customers¹² in far northeastern Oklahoma’s Craig, Delaware, and Ottawa counties.

EDE owns generation capacity of 1,280 megawatts and operates seven generation plants, none of which are located in Oklahoma. Most of Empire’s generating facilities are located in southwestern Missouri. However, Empire does have generation facilities located at Riverton,

¹² Oklahoma Corporation Commission, *The State of Oklahoma’s 13th Electric System Planning Report*, http://www.occeweb.com/pu/PUD%20Reports%20Page/13th2015_ESPR.pdf (June 21, 2016).

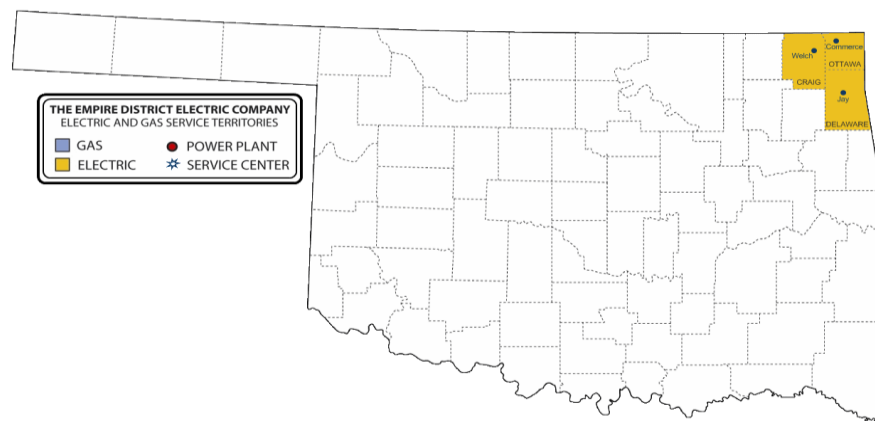
Kansas, and Plum Point, Arkansas. Table 4 shows EDE's generation sources by fuel type, location and capacity, and Figure 8 displays the utility's service territory.

Table 4: EDE-Owned Generation Facilities¹³

Facility Name	Location	Generation Capacity
Asbury (coal)	Asbury, MO	198 MW
Riverton (coal and gas)	Riverton, KS	177 MW
Iatan Units 1 & 2 (coal)	Weston, MO	191 MW*
State Line Combined Cycle (gas)	Joplin, MO	295 MW*
State Line Unit 1 (gas)	Joplin, MO	96 MW
Energy Center (gas)	LaRussell, MO	257 MW
Ozark Beach (hydro)	Ozark Beach, MO	16 MW
Plum Point (coal)	Osceola, AR	50 MW*

*Co-owned. Capacity listed is EDE-owned generation capacity.

Figure 8: Empire District Electric Company Service Territory Map



Source: The Empire District Electric Company, *Service Territory Map*, <https://www.empiredistrict.com/About/servicearea.aspx?state=OK> (June 1, 2016).

¹³ The Empire District Electric Company, *Fast Facts*, <https://www.empiredistrict.com/About/FastFacts.aspx> (June 1, 2016).

Electric Cooperatives

Thirty electric cooperatives serve Oklahoma. The role of electric cooperatives in the State is critical, as they, as a group, have infrastructure in and provide service to all 77 counties in Oklahoma. Together the cooperatives serve half a million customers, have more than 100,000 miles of electric distribution line and nearly 10,000 miles of transmission line. Appendix B gives a complete listing of cooperatives serving Oklahoma.

There are three generation and transmission cooperative providers serving the State. These are Golden Spread Electric Cooperative, Western Farmers Electric Cooperative and KAMO Power. These entities are owned by individual member electric distribution cooperatives. WFEC and KAMO Power are the predominant providers of power to electric cooperatives in Oklahoma. Golden Spread Electric Cooperative, based in Amarillo, Texas, serves one Oklahoma distribution cooperative. Detailed membership lists for these generation and transmission cooperatives are contained as part of Appendix B.

Western Farmers Electric Cooperative

Western Farmers Electric Cooperative (“WFEC”), headquartered in Anadarko, Oklahoma, is the largest generation and transmission cooperative in Oklahoma. WFEC, owned by its member electric cooperatives, is a regional electric generation and transmission cooperative founded in 1941. It generates electric power from self-owned generation facilities and transmits that power to 17 distribution electric cooperatives whose service areas cover three-quarters of the State.¹⁴ WFEC member cooperatives operate in all but the northeastern portion of Oklahoma and also serve over two-thirds of rural Oklahoma. WFEC owns and maintains more than 3,700 miles of transmission line and has over 1,320 MW of generating capacity in Oklahoma. In addition to its owned generation capacity, WFEC also purchases wind power and hydroelectricity from other utilities. Table 5 shows WFEC’s owned generation sources by fuel type, location and capacity, and Figure 9 displays the cooperative’s service territory.

Table 5: WFEC-Owned Generation Facilities¹⁵

Facility Name	Location	Generation Capacity
Hugo Plant (coal)	Fort Towson/Hugo	450 MW
Mooreland Plant (natural gas)	Mooreland	304 MW
Anadarko Plant (natural gas)	Anadarko	374 MW

¹⁴ WFEC also has 4 member cooperatives in New Mexico.

¹⁵ Oklahoma Corporation Commission, *The State of Oklahoma’s 11th Electric System Planning Report*.

Figure 9: Western Farmers Electric Cooperative Service Territory Map



KAMO Electric Cooperative

KAMO Electric Cooperative (“KAMO Power”), headquartered in Vinita, Oklahoma, is another major generation and transmission cooperative providing wholesale electric power in Oklahoma. This member-owned generation and transmission cooperative serves customers in northeastern Oklahoma and southwestern Missouri. KAMO Power serves 17 electric distribution cooperatives, eight of which are located in Oklahoma. It owns 38% of Grand River Dam Authority’s coal-fired GRDA generation unit No. 2. The remainder of KAMO Power’s power requirements is purchased from Associated Electric Cooperative, Inc., of which it is a part-owner. Table 6 shows KAMO Power’s owned generation source by fuel type, location and capacity, and Figure 10 displays the cooperative’s service territory.

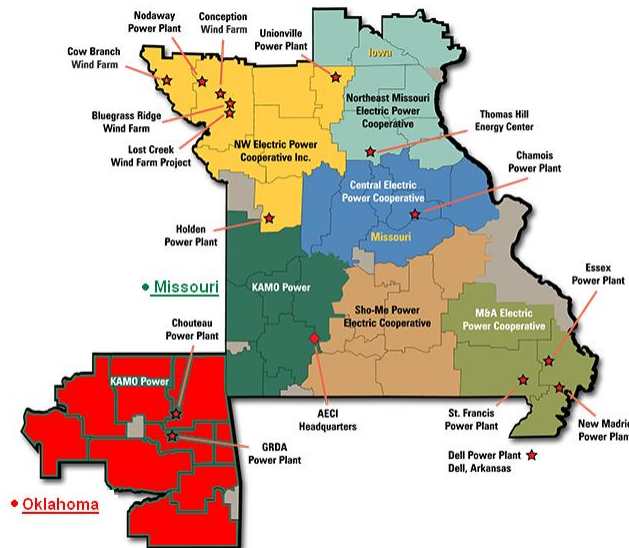
Table 6: KAMO Power-Owned Generation Facilities

Facility Name	Location	Generation Capacity
GRDA CFP 2 (coal)**	Chouteau	198 MW*

*Co-owned. Capacity listed is KAMO Power-owned generation capacity.

**Although KAMO Power owns this capacity, the power from the GRDA facility has been integrated into AECl generation resources.

Figure 10: KAMO Power Service Territory



Public Sector Utilities

Under Oklahoma statutes, the OCC does not regulate any entity that is operated by a governmental subdivision. Of the largest providers of electricity in Oklahoma, two providers, the Oklahoma Municipal Power Authority and the Grand River Dam Authority, fall into the category of public sector utilities.

Oklahoma Municipal Power Authority

The Oklahoma Municipal Power Authority (“OMPA”) is a joint-action agency created for the purpose of providing an adequate, reliable and affordable supply of electrical power and energy to Oklahoma's municipally-owned electric systems. OMPA presently serves 39 municipally-owned electric systems in Oklahoma. As a consumer-owned public power entity, OMPA is owned by the member cities it serves. The members of OMPA include the following:

City of Altus	Town of Goltry	Town of Okeene	City of Tecumseh
City of Blackwell	Town of Granite	Town of Olustee	City of Tonkawa
City of Comanche	City of Hominy	Town of Orlando	City of Walters
Town of Copan	City of Kingfisher	City of Pawhuska	City of Waynoka
City of Duncan	Town of Laverne	City of Perry	City of Watonga
City of Edmond	City of Lexington	City of Ponca City	City of Wetumka
Town of Eldorado	City of Mangum	City of Pond Creek	City of Wynnewood
City of Fairview	Town of Manitou	City of Prague	City of Yale
City of Frederick	City of Marlow	City of Purcell	
Town of Ft. Supply	Town of Mooreland	Town of Ryan	
City of Geary	City of Newkirk	Town of Spiro	

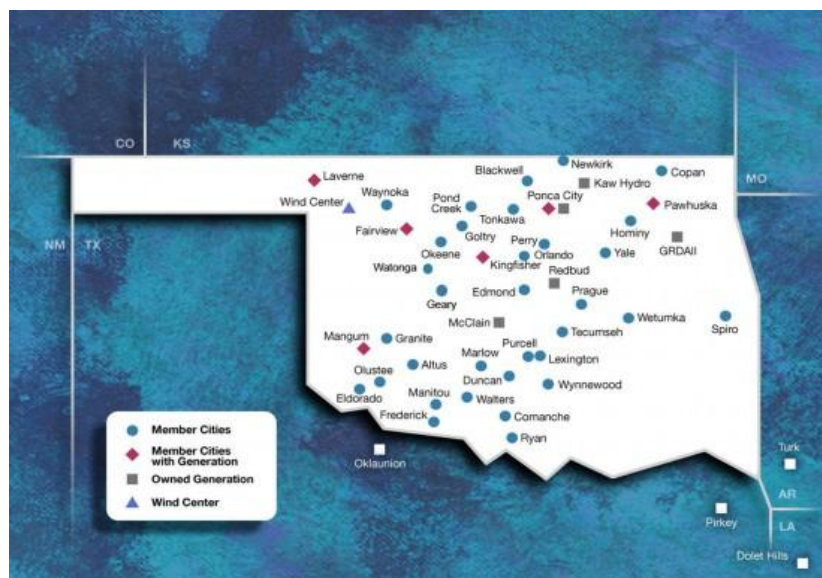
OMPA owns or co-owns eight generation facilities to serve its members. Coal, natural gas, and hydroelectricity are all utilized in electricity generation by the plants. OMPA also purchases wind power from the Oklahoma Wind Energy Center in Woodward, OK to serve its members. Table 7 shows OMPA's owned generation sources by fuel type, location and capacity, and Figure 11 displays the Authority's member locations.

Table 7: OMPA-Owned Generation Facilities

Facility Name	Location	Generation Capacity
Kaw Hydroelectric Plant (hydro)	Ponca City	29 MW
Oklahoma Power Station (coal)	Vernon, TX	80 MW*
McClain Plant (natural gas)	Newcastle	118 MW*
Red Bud Plant (natural gas)	Luther	158 MW*
Henry W. Pirkey Plant (lignite)	East Texas	15 MW*
Dolet Hills (lignite)	DeSoto Parish, LA	25 MW*
Ponca City Power Plant (natural gas)	Ponca City	104 MW
John W. Turk, Jr. Power Plant (coal)	Fulton, AR	43 MW*

*Co-owned. Capacity listed is OMPA-owned generation capacity.

Figure 11: OMPA Member Municipalities



Source: Oklahoma Municipal Power Authority, *Member Cities*, <http://ompa.com/about/member-cities/> (June 1, 2016).

Grand River Dam Authority

The Grand River Dam Authority (“GRDA”) is an agency of the State of Oklahoma authorized under 82 O.S. § 861, one of only two such entities established by government action that exist in the United States, the other being the Tennessee Valley Authority. GRDA was created by the Oklahoma Legislature in 1935 as a conservation and reclamation district and it owns and operates electric generation, transmission and distribution facilities, mainly within the northeastern portion of the State. GRDA is a non-appropriated State agency — funded fully by revenues generated from the sale of electricity and water, and not by public dollars. GRDA has a seven-member governing board that includes three gubernatorial appointments, one member appointed by the President Pro Tempore of the Oklahoma State Senate, one member appointed by the Speaker of the Oklahoma House of Representatives, one member appointed by the Oklahoma Association of Electric Cooperatives, and one designee of the Municipal Electric Systems of Oklahoma. GRDA headquarters are located in Vinita, Oklahoma. Table 8 shows GRDA’s owned generation sources by fuel type, location and capacity, and Figure 12 displays the Authority’s service territory.

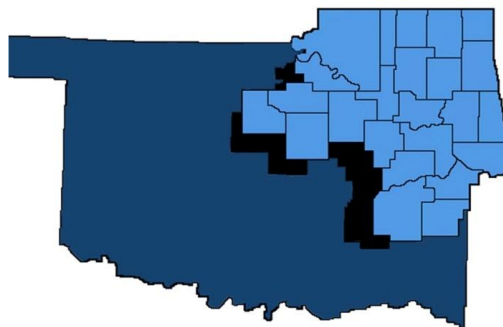
Table 8: GRDA-Owned Generation Facilities

Facility Name	Location	Generation Capacity
Pensacola (hydro)	Langley	126 MW
Markham Ferry (hydro)	Locust Grove	128 MW
Salina Pumped Storage (hydro) Units 1, 2 and 3	Salina	130 MW
Salina Pumped Storage (hydro) Units 4, 5 and 6	Salina	130 MW
Grand River Energy Center Unit 1 (coal)	Chouteau	490 MW
GRDA CFP Unit 2 (coal)	Chouteau	322 MW*
GRDA CFP Unit 3 (natural gas)	Chouteau	495 MW
Redbud Gas Plant (natural gas)	Luther	439 MW*

*Co-owned. Capacity listed is GRDA-owned generation capacity.

Source: Grand River Dam Authority, *GRDA 2015 Comprehensive Annual Financial Report*, http://www.grda.com/wp-content/uploads/2015/04/CAFR_2016-05-23.pdf (June 6, 2016).

Figure 12: GRDA Service Territory



Energy Efficiency for Electricity

The State of Oklahoma, local governments, and Oklahoma electric utilities all offer energy efficiency programs to help reduce demand and delay the need for new electric generation. On the utility side, the most popular programs encourage customers to invest in energy efficient systems and equipment that offer the ability to lower a customer's on-peak electric usage. In 2014, ratepayer-funded expenditures for electric and gas efficiency and load management programs totaled \$84.9 million in Oklahoma. Of this total, \$71.9 million was spent on energy efficiency and load management programs for electricity. State- and local-administered programs also focus on energy efficient equipment and increasing public buildings' efficiency.

Utility-Administered Programs

The State's largest electric utility, OG&E, has a goal to build no new generation until at least 2020. Therefore, OG&E manages the following programs: Home Energy Efficiency, Positive Energy-New Home Construction, Weatherization Residential Assistance, Commercial Energy Efficiency, Integrated Volt Var Control, and an Education Program.

PSO also operates a number of demand side management programs. Most recently, PSO gained approval of the following programs: Home Weatherization, High Performance Homes, Energy Saving Products, High Performance Business, Business Demand Response, Behavioral Modification and a Conservation Voltage Reduction, and an Education Program.

WFEC operates a rebate program for high efficiency HVAC systems, including both air source and ground source heat pumps, to reduce consumer demand during peak demand periods. Requirements for these equipment rebates have evolved overtime as the economics for both the cooperative and consumers have become better understood. Because of Oklahoma's extreme heat in summer months, WFEC has found that there is a significant difference in efficiency between air source equipment and ground source equipment during peak periods of electric demand and thus has modified its rebate program to reflect these findings, with special emphasis placed on renewable energy provided by geothermal technology.

OMPA also offers efficiency and demand-side management programs, including the WISE program, to install energy-efficient air conditioners and electric heat pumps; the WISE Loan program, which offers low-interest financing to qualified customers for approved energy-saving measures, such as heat pumps, electric water heaters, insulation, programmable thermostats and weather stripping; and the DEEP program, which provides matching funds to customers who implement energy-saving measures that will reduce their summer peak electric demand.

Together, in 2014, utility-operated demand-side management programs in Oklahoma conserved 180,032 MWh of electricity.¹⁶

¹⁶ American Council for an Energy Efficient Economy, *Net Incremental Savings from Electric Energy Efficiency Programs*, 2010, <http://database.aceee.org/sites/default/files/docs/spending-savings-tables.pdf> (June 6, 2016).

State-Administered Programs

Beginning in 2009, 61 O.S. § 213 required all new State-owned buildings or major renovations of State-owned buildings of 10,000 square feet or more to meet Leadership in Energy and Environmental Design (“LEED”) or Green Building Initiative’s Green Globes standards. In addition, in 2012, 27A O.S. § 3-4-106.1 established the Oklahoma State Facilities Energy Conservation Program, which directs all State agencies and higher education institutions to achieve an energy efficiency and conservation improvement target of at least 20% by the year 2020. Improvement is based upon benchmarks prior to implementation of the program. Upon implementation, all agencies are required to input historical utility cost into approved software on a monthly basis. Costs associated with the implementation of this program are to be fully funded by program savings.

Local Government Programs

Finally, it should be mentioned that there are numerous local energy efficiency efforts underway which are coordinated by the State. These efforts mainly include energy efficient upgrades of municipal lighting and HVAC equipment as well as insulation of public buildings. In addition, Oklahoma has two statutes that authorize county governments to develop Property-Assessed Clean Energy (“PACE”) financing to facilitate energy efficiency improvements for property owners. Oklahoma’s Energy Independence Act, 19 O.S. § 460.1-460.7, authorizes counties to create “County District Energy Authorities” that can issue notes/bonds, seek out public/private lenders, and apply for grants/loans from other governmental entities to establish and fund local PACE programs. Once a county has established the Authority and PACE program, county property owners can receive a loan from the county for permanently-fixed renewable energy or energy efficiency improvements to their properties. These loans are then repaid through the owner’s property taxes and constitute a lien on the property until paid in full. At this writing, no counties are using this mechanism.

Renewable Energy for Electricity

As of March 2016, Oklahoma sourced approximately 36% of its net MWh of electricity generated from renewable sources, mainly from wind, and also hydroelectric sources.¹⁷ To continue the momentum of diversifying the fuel sources used by Oklahomans and promoting economic opportunities, in 2010, 17 O.S. § 801.4 established a renewable energy goal for electric utilities operating in the State. The goal called for 15% of the total installed generation capacity in Oklahoma to be derived from renewable sources by 2015. Eligible renewable energy resources included wind, solar, hydropower, hydrogen, geothermal, biomass, and other renewable energy resources approved by the Oklahoma Corporation Commission (“OCC”).

¹⁷ U.S. Energy Information Administration, http://www.eia.gov/electricity/monthly/xls/table_1_10_a.xlsx (June 7, 2016).

Energy efficiency was allowed to be used to meet up to 25% of the overall 15% renewable energy goal. In 2013, the OCC reported that the State's utilities had exceeded the 2015 goal.¹⁸

In 2015, Oklahoma ranked 4th in the nation for installed wind-powered generating capacity, with more than 5,453 MW installed.¹⁹ This ranking represents an increase from Oklahoma's 2012 standing of 6th in the nation, with 3,100 MW wind capacity installed.

The State also relies on hydroelectricity to meet a portion of its electric demand, but in recent years the overall megawatt hours of hydroelectricity used has declined. In 2010, hydroelectricity accounted for nearly 3 million MWhs of the electric power generated in Oklahoma. Conversely, by 2014, hydroelectricity accounted for nearly 1.5 million MWhs of generation in Oklahoma.²⁰

In 2016, Oklahoma remains a strong market for geothermal heat pumps, but there has been some slight decline. Overall, geothermal still has strong utility support, and many public and private commercial buildings are adopting the technology as well.

OMPA has seen geothermal system installation numbers shrink over the past year. In the past year, only 49 units were rebated over OMPA's 42 member city municipalities, mainly in the Edmond area. Some of those municipalities offer a loop lease program to help offset some of the initial cost, but it is underutilized.

OG&E has also placed some limitations on its geothermal incentive program. It has removed the rebate for new construction and reduced the geothermal rebate for existing home conversions to \$50 per ton. However, OG&E plans to make additional changes to potentially augment its geothermal program by the end of 2016.

WFEC has conducted a study, with the help of an independent third party, which showed a 2.2 kW reduction in peak load for an average 4-ton system. In light of this long-term, peak savings opportunity, WFEC has raised its rebates for installation of geothermal systems to \$1,050 per ton for all of its 18 rural electric cooperatives. Some of these cooperatives have loop lease programs and other geothermal services available. WFEC also has an expert consultant available to answer questions and refer home- and business-owners to qualified geothermal system installers in their area. Commercially, demand for geothermal heat pump technology has increased. Many public and private commercial buildings are choosing geothermal for their heating and cooling needs, highlighting the financial viability of the technology. Recent public projects include the

¹⁸ Oklahoma Corporation Commission, *The Oklahoma Corporation Commission's 2013 Report on the Oklahoma Energy Security Act* (2014). <http://www.occeweb.com/pu/PUD%20Reports%20Page/2013%20Report%20on%20Renewable%20Energy%20Goals.pdf> (June 6, 2016).

¹⁹ American Wind Energy Association, *Oklahoma Wind Energy Fact Sheet*, <http://awea.files.cms-plus.com/FileDownloads/pdfs/Oklahoma.pdf> (June 7, 2016).

²⁰ U.S. Energy Information Administration, *Table 5, Electric power industry generation by primary energy source, 1990 through 2014*, <https://www.eia.gov/electricity/state/oklahoma/> (June 22, 2016).

Putnam City Schools, Moore Public Schools, and Del City Public Works. Recent private geothermal projects include those at Gulfport Energy, St. Anthony Healthplex, Catholic Charities Archdiocese of Oklahoma City, Uptown Grocery of Oklahoma City and 21C Museum and Hotel all of Oklahoma City. Finally, Oklahoma's State Capitol Building is also the only Capitol building in the nation powered by geothermal energy. Since the 1990s, the building has relied on over 600 geothermal heat pumps to heat and cool the building.

In addition to Oklahoma's use of geothermal heat pumps and other renewable resources discussed above, solar technology is being used in the State. Oklahoma has the eight best solar resource in the nation.²¹ However, with the 5.2 MWs of solar energy currently installed in Oklahoma, the State ranks 45th in the country in installed solar capacity.²² Part of the reason Oklahoma does not experience higher levels of solar panel installations because Oklahoma has some of the lowest electricity prices in the nation. Another reason is the lack of third party ownership, which allows a residential or business owner to buy electricity by the kilowatt-hour usually through a lease model or a purchase power agreement from the owner of the system. Only utilities are able to provide this type of agreement to its ratepayers through utility-scale solar farms or community solar projects. Community solar allows individual ratepayers to share the benefits of one local installation.

In 2015, Oklahoma saw 3.7 MWs of solar capacity being installed, which was a 526% increase over 2014.²³ In 2015, Oklahoma ranked 38th in the nation in installed solar capacity.²⁴ Of the solar capacity installed in Oklahoma in 2015, 456 kW were installed on residential homes and 3.2 MW were utility-scale installations.²⁵ OG&E contributed to the utility-scale installations by building a solar farm in two sections at its Mustang power plant facility. The north section of the solar farm has 8,000 sun-tracking solar panels capable of generating two megawatts. The south section has 2,000 stationary panels capable of generating half-megawatt. Combined, the farm of solar panels generates enough electricity to power around 500 homes.

In 2016, Today's Power, Inc., ("TPI") a subsidiary of Arkansas Electric Cooperatives, Inc., agreed to build one MW solar array for Tri-County Electric Cooperative ("TCEC") near its headquarters in Hooker, Oklahoma. TCEC offers its members the opportunity to purchase solar energy produced by the new system, making it the first electric utility in Oklahoma to offer community solar to its members. Interested members may purchase a panel or more if they choose, and receive a credit on their bill for the energy produced by that panel. All members will

²¹ Oklahoma Renewable Energy Council, *Quick Facts – Solar*, <http://www.okrenewables.org/quick-facts> (June 22, 216).

²² Solar Energy Industries Association, *Solar Spotlight: Oklahoma*, <http://www.seia.org/sites/default/files/OK%20Factsheet%20Final.pdf#overlay-context=state-solar-policy/oklahoma> (June 22, 2016).

²³ Ibid.

²⁴ Ibid.

²⁵ Ibid.

benefit from the community solar project regardless of their participation because the energy produced at the facility will be consumed by TCEC's membership, which should result in savings in wholesale power fees and related costs. In addition, members that do not choose to participate will not subsidize the project. TCEC's community solar facility is projected to generate 50,473 MWhs of electricity over its 25-year useful life. As of this writing, more community solar facilities are planned and some are being constructed with an anticipated operation date later in the year 2016.

PETROLEUM PROFILE

Oklahoma produces a substantial amount of oil, with annual production accounting for more than 3% of total U.S. production in recent years. Currently, Oklahoma ranks 5th in crude oil production nationally. Two of the 100 largest oil fields in the United States are found in Oklahoma, which is host to over 3,000 oil and gas well operators and home to more than 100,000 active oil wells and more than 40,000 active gas wells.

Crude Oil in Oklahoma

The mid-continent crude oil trading and storage hub at Cushing, OK, is the nation's largest commercial crude oil tank farm, with an estimated more than 70 million barrels of working storage capacity, according to the U.S. Energy Information Administration. The Cushing crude oil trading hub also connects Gulf Coast refiners to producers in the United States and Canada. Traditionally, the Cushing Hub has pushed Gulf Coast and Mid-Continent crude oil supply north to Midwest refining markets. However, production from those regions is in decline, and an underused crude oil pipeline system has been reversed to deliver heavy crude oil supply — produced in Alberta, Canada, and pumped to Chicago via the Enbridge and Lakehead Pipeline systems — to Cushing, where it can access Gulf Coast refining markets. Cushing is the designated delivery point for New York Mercantile Exchange ("NYMEX") crude oil futures contracts.

Crude oil supplies from Cushing that are not delivered to the Midwest are fed to Oklahoma's five major oil refineries, which have a combined distillation capacity of approximately 511,000 barrels/calendar day — roughly 3% of the total U.S. refining capacity.²⁶ Table 9 lists these refineries, the largest of which is the Ponca City Refinery that ConocoPhillips owns and operates.

²⁶ U.S. Energy Information Administration, *Oklahoma State Profile and Energy Estimates*, <http://www.eia.gov/state/data.cfm?sid=OK#ReservesSupply> (June 22, 2016).

Table 9: Oil Refineries in Oklahoma²⁷

Company	Refinery Name	Location	Capacity
Valero	Ardmore Refinery	Ardmore	85,000 bbl/d
CVR Energy	Wynnewood Refinery	Wynnewood	70,000 bbl/d
Ventura Refining & Transmission	Thomas Refinery	Thomas	12,000 bbl/d
ConocoPhillips	Ponca City Refinery	Ponca City	198,400 bbl/d
HollyFrontier Corporation ²⁸	Tulsa Refinery (East)	Tulsa	125,000 bbl/d

Several petroleum product pipelines connect those refineries to consumption markets in Oklahoma and nearby states. One of the largest of these, the Explorer Pipeline, originates on the Texas coast and receives products from Oklahoma refineries before continuing on to supply Midwest markets. The major pipeline companies in the State include:

Amoco	Jayhawk	Seaway
Arco	Koch	Shell
Conoco	Mobil	Sun
Duke	Natural Gas Clearinghouse	Texaco
Farmland	Ozark	Ultramar-Diamond Shamrock

In addition to the oil that enters Oklahoma from neighboring states, the State produced an average of 432,000 barrels of crude oil per day in 2015.²⁹ Figure 13 visually summarizes oil production in Oklahoma from years 1981 to 2015. As indicated, overall Oklahoma crude oil production was trending downward until a surge in use of horizontal fracturing or “fracking” techniques since 2010 helped to pushed production back up to levels not seen since the mid-1990s.³⁰ However, international economic weakness and uncertainty and a world oversupply of crude has kept downward pressure on oil prices in Oklahoma and elsewhere during the past couple of years. In terms of future production, Oklahoma had 1,241 million barrels of proven reserves at the end of 2014, accounting for 3.4% of all U.S. reserves.³¹

²⁷ U.S. Energy Information Administration. *Capacity of Operable Petroleum Refineries by State as of January 1, 2016*, <http://www.eia.gov/petroleum/refinerycapacity/table3.pdf> (June 7, 2016).

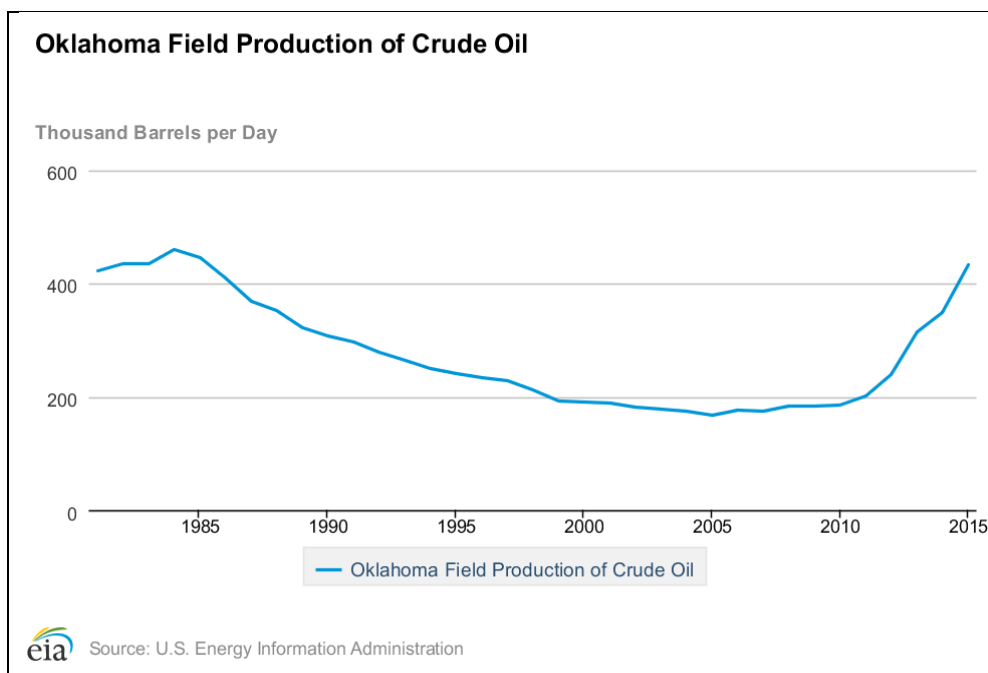
²⁸ HollyFrontier Corporation, *Tulsa Refinery*, <http://www.hollyfrontier.com/operations/refineries/default.aspx> (June 7, 2016).

²⁹ U.S. Energy Information Administration, *U.S. Energy Information Administration, Petroleum & Other Liquids, Crude Oil Production, 2015*, http://www.eia.gov/dnav/pet/pet_crd_crpdn_adc_mbbldpd_a.htm (June 24, 2016).

³⁰ U.S. Energy Information Administration, *Today In Energy, Monthly U.S. Crude Oil Production, July 1997-September 2012*, <http://www.eia.gov/todayinenergy/detail.cfm?id=9030%20> (June 7, 2016).

³¹ U.S. Energy Information Administration, *Crude Oil Proved Reserves, Reserves Changes, and Production*, http://www.eia.gov/dnav/pet/pet_crd_pres_a_EPC0_R01_mmbbl_a.htm (June 21, 2016).

Figure 13: Oklahoma Production of Crude Oil, 1981-2015

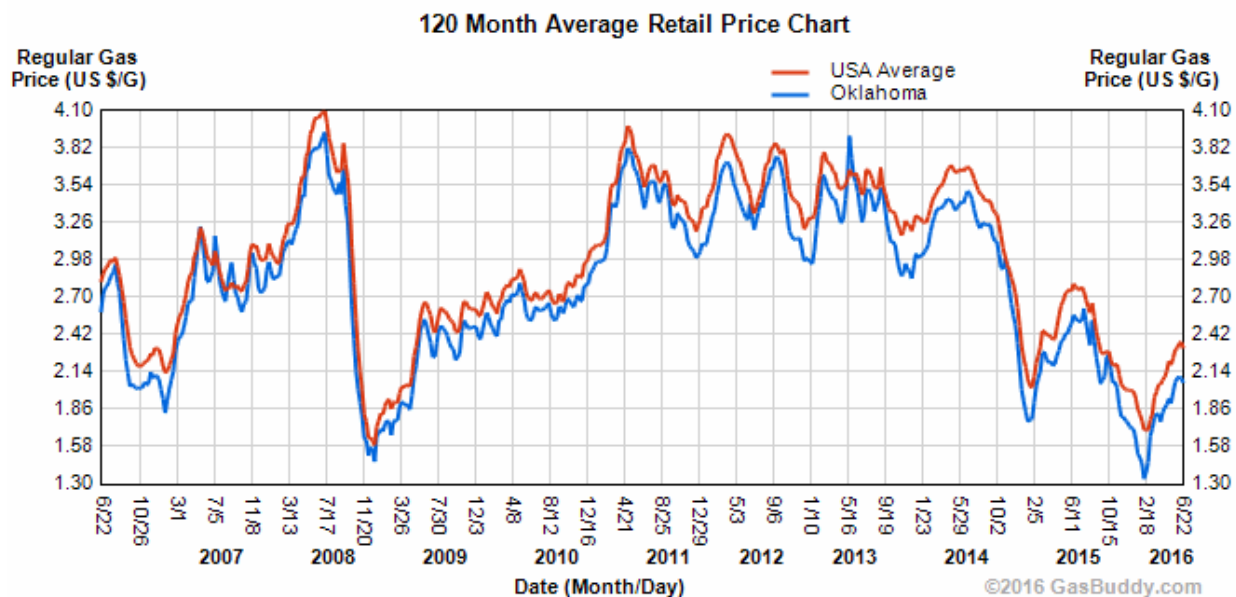


Source: U.S. Department of Energy, U.S. Energy Information Administration, *Oklahoma Field Production of Crude Oil*, <https://www.eia.gov/dnav/pet/hist/LeafHandler.ashx?n=pet&s=mcrfpok1&f=a> (June 24, 2016).

With regard to the prices of petroleum in Oklahoma, the average first purchase price of crude was \$33.09/barrel in March 2016, as compared to the national average crude price of \$31.87/barrel.³² In contrast to Oklahoma crude being more expensive than the national average, in general, the price of regular motor gasoline sold in Oklahoma tends also to be less expensive than the national average. Figure 14 lists the price of regular motor gasoline sold in Oklahoma from 2007 to 2016, which, over time, trended approximately 4 to 5 cents cheaper than the national average. The figure also demonstrates the relative volatility in gasoline prices, especially since 2008.

³² U.S. Energy Information Administration, *Petroleum and Other Liquids, Domestic Crude Oil First Purchase Prices By Area*, http://www.eia.gov/dnav/pet/pet_pri_dfp1_k_m.htm (June 7, 2016).

Figure 14: 120 Month Average Retail Price Chart, USA Average & Oklahoma Average, 2007-2016



Source: GasBuddy, Gas Price Charts, <http://www.gasbuddy.com/Charts> (June 22, 2016).

Crude Oil/Petroleum Industry Oversight

Both federal and state agencies regulate the crude oil and petroleum industry. At the federal level, much of the regulation occurs through the U.S. Environmental Protection Agency (“EPA”). At the State level, both the OCC³³ and the Department of Environmental Quality (“DEQ”) provide regulatory oversight.

The OCC’s Oil and Gas Conservation Division, with its headquarters in Oklahoma City and additional administrative and judicial activities in Tulsa, regulates activities across the State involving oil and gas drilling and production and disposal of produced waters and drilling fluids, and through its field staff from four regional offices (in Ada, Bristow, Duncan and Kingfisher) conducts on-site inspections of wells and other oilfield activities and enforces Commission rules that govern Oklahoma oilfield practices, to protect the rights of oil and gas operators and mineral owners, the environment and the public. A more complete discussion of the regulatory activities conducted by OCC’s Oil and Gas Conservation Division can be found in the Mitigating, Tracking, and Responding to Energy Emergencies section of this report. These regulatory activities include both safety and preventative measures, as well as procedures for response in the event of a spill, explosion, or other wellsite emergencies. To ensure that Oklahoma

³³ Resulting from Oklahoma’s Native American history, production from some tribal lands falls under the regulation of the Bureau of Indian Affairs.

regulations are adequate and updated, the OCC's Oil and Gas Conservation Division participates in regional and national organizations. The State of Oklahoma also is a member of and its representatives, led by the Governor, actively participate in the Interstate Oil and Gas Compact Commission, which conducts a State Review of Oil and Natural Gas Environmental Regulations that focuses on assisting states to peer review their regulations and share best practices. The OCC Oil and Gas Conservation Division is also a member of the Ground Water Protection Council.

Once oil leaves the wellsite, the OCC's Transportation Division, which includes the Pipeline Safety Department, is responsible for regulating the transport of oil and drilling fluids, both by truck and through pipelines. A more detailed discussion of the role of the Transportation Division, including pipeline safety, appears in the Natural Gas industry profile below.

Additionally, the Oklahoma Marginal Well Commission supports technology transfer to help operators keep their wells in production as long as possible. Also, the Oklahoma Department of Environmental Policy ("ODEQ") regulates oil refinery sites, primarily from an air and water quality standpoint.

After crude oil is refined and processed into motor fuel, the OCC has regulatory authority over the underground or aboveground tanks used for the storage of this motor vehicle fuel on-site at filling stations statewide. A complete discussion of the measures involved in assuring safety of motor vehicle fuel can be found in the Mitigating, Tracking, and Responding to Energy Emergencies section of this document.

A complete discussion of the authority of the U.S. Environmental Protection Agency ("EPA") in regulating the safety of the oil and petroleum industry can be found in the Mitigating, Tracking, and Responding to Energy Emergencies section of this document.

Outside of the public sector, the OCC works collaboratively with the Oklahoma Energy Resources Board, which is a voluntary industry group funded by a one-tenth of one percent (.001) assessment on the first sale of oil and natural gas at the wellhead. Half of this fund is used for the restoration of abandoned well sites.

Industry Stakeholders

There are a number of oil and natural gas trade associations active in Oklahoma. Among the largest are the Oklahoma Petroleum Marketers and Convenience Storage Association, the Mid-Continent Oil and Gas Association, and the Oklahoma Independent Petroleum Association, which each provide a key contact between State officials and industry.

NATURAL GAS PROFILE

Oklahoma is one of the top natural gas producers in the United States and production typically accounts for almost one tenth of the U.S. total. At the end of 2013, ten of the 100 largest natural gas fields in the country were found in the State, and proven reserves of conventional natural gas have been increasing in recent years.³⁴ Likewise, Oklahoma has large reserves of coalbed methane in the Arkoma Basin and the Cherokee Platform in eastern counties. It is essential to remember that Oklahoma's natural gas production is critical not only to meet market demand inside the State but also to meet demand from other regions of the country as well. In fact, only about one third of Oklahoma's natural gas output is consumed within the State. The remaining supply is sent via pipeline to neighboring states, the majority to Kansas and to natural gas trading hubs in Texas and Kansas and extends to markets through the Midwest and elsewhere. In addition to supplying neighboring states, Oklahoma imports a significant quantity of natural gas. Almost 90% of the imports that enter the State arrive via pipelines from Texas and Colorado.

In terms of consumption, the electricity generation and industrial sectors use most of the natural gas in Oklahoma. About three fifths of Oklahoma households also use natural gas as their primary energy source for home heating. In 2016, the wholesale city gate price in Oklahoma was \$3.68/thousand cubic feet, as compared to a national average of \$3.46. By comparison, the residential retail price at the burner tip was \$6.82 compared to an average of \$8.39 across the rest of the country. With regard to the future natural gas production potential, Oklahoma had 31,778 billion cubic feet of dry natural gas and 1,752 million barrels of natural gas liquids in known reserves in 2014. Additionally, as of February 2016, Oklahoma had 329,723 million cu. ft. of natural gas in underground storage.³⁵

In terms of production and supply, in 2014, Oklahoma had 40,070 operational natural gas wells.³⁶ In that same year, the State produced 2,310,114 million cubic feet (MMcf) of gas. In 2015, production was higher at 2,499,599 million cubic feet (MMcf) of gas.³⁷

As listed in Figure 15, Oklahoma's natural gas production varies from year to year. In the years 2014 and 2105, marketed production has been at its highest since the late 1980s through the early 1990s.

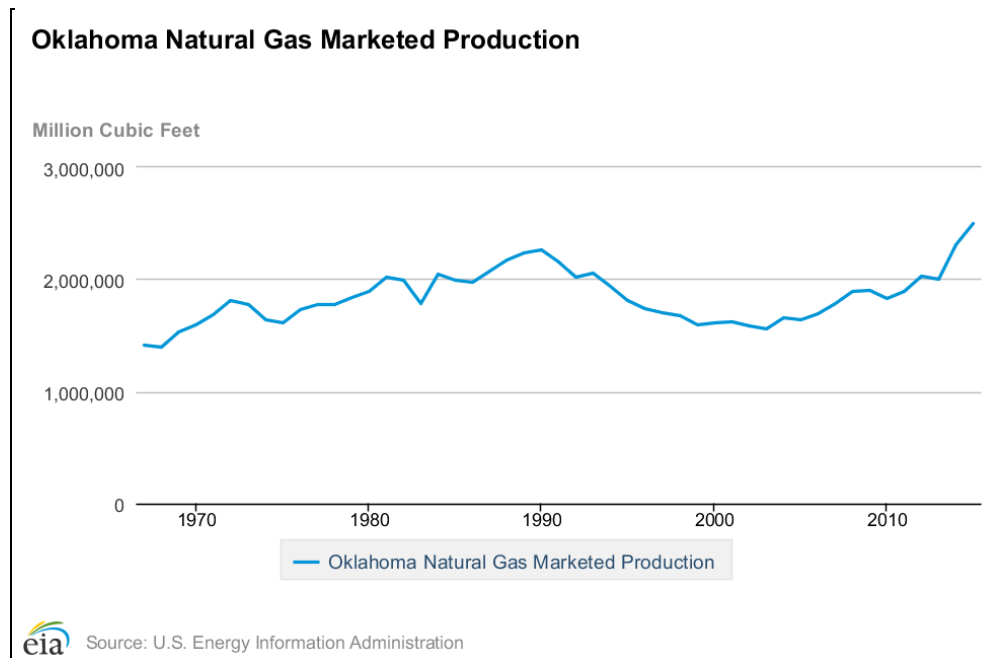
³⁴ U.S. Department of Energy, *U.S. Energy Information Administration, Top 100 U.S. Oil and Gas Fields*, <https://www.eia.gov/naturalgas/crudeoil/reserves/top100/pdf/top100.pdf> (June 21, 2016).

³⁵ U.S. Energy Information Administration, *Oklahoma Profile Data, Reserves and Supply*, <http://www.eia.gov/beta/state/data.cfm?sid=OK#ReservesSupply> (June 7, 2016).

³⁶ U.S. Department of Energy, *U.S. Energy Information Administration, Natural Gas, Number of Producing Gas Wells*, http://www.eia.gov/dnav/ng/ng_prod_wells_s1_a.htm (June 24, 2016).

³⁷ U.S. Department of Energy, *U.S. Energy Information Administration, Natural Gas, Gross withdrawals and Production*, <https://www.eia.gov/naturalgas/crudeoil/reserves/top100/pdf/top100.pdf> (June 21, 2016), http://www.eia.gov/dnav/ng/ng_prod_sum_a_EPG0_VGM_mmcf_a.htm (June 24, 2016).

Figure 15: Natural Gas Production in Oklahoma, 1967-2015



Source: U.S. Department of Energy, U.S. Energy Information Administration, *Oklahoma Natural Gas Gross Withdrawals and Production*, <https://www.eia.gov/dnav/ng/hist/n9050ok2a.htm> (June 24, 2016).

Natural Gas Providers in Oklahoma

Natural Gas Utilities

The six natural gas companies that provide retail service in most of the State and are regulated by the State are:

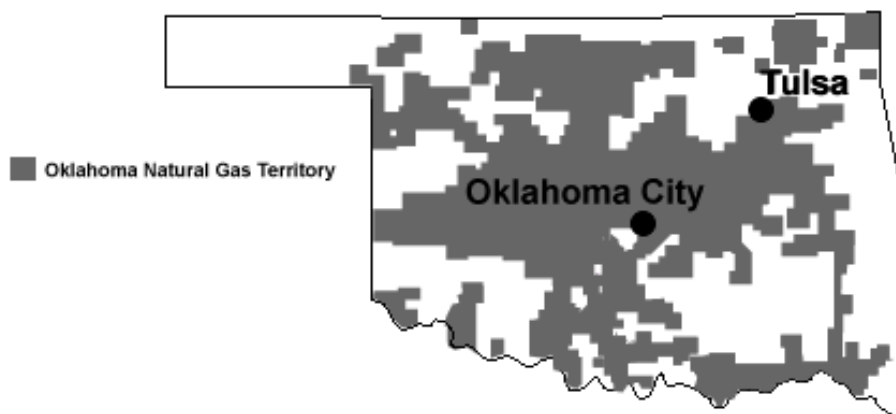
- Arkansas Oklahoma Gas Corporation
- CenterPoint Energy Oklahoma Gas
- Ft. Cobb Fuel Authority/LeAnn Gas
- Oklahoma Natural Gas Company
- Panhandle Natural Gas, Incorporated
- West Texas Gas Company

Of these regulated utilities, the two largest providers are Oklahoma Natural Gas Company and CenterPoint Energy Oklahoma Gas.

Oklahoma Natural Gas Company

Oklahoma Natural Gas Company is a division of Tulsa-based ONE Gas, Inc., a natural gas distribution company that is the successor to ONEOK, Inc. ONE Gas is among the largest natural gas distributors in the United States, serving more than 2 million customers in Oklahoma, Kansas, and Texas. In Oklahoma, Oklahoma Natural Gas serves approximately 860,550 residential, commercial and industrial customers and maintains 19,000 miles of distribution mains in the State.

Figure 16: Oklahoma Natural Gas Company Service Territory Map



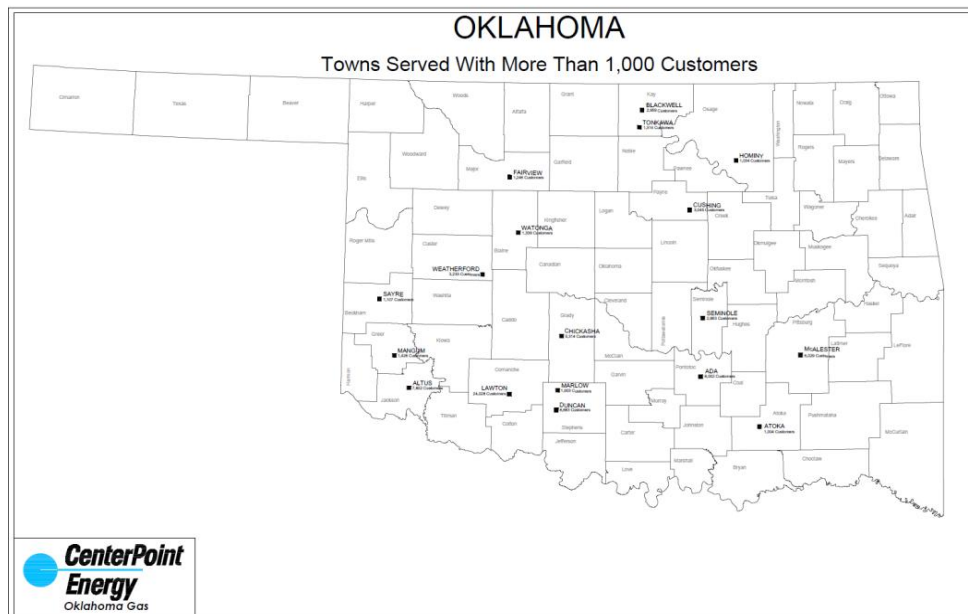
Source: Oklahoma Natural Gas Company, *About Us*,
<http://www.oklahomanaturalgas.com/en/About.aspx> (June 7, 2016).

CenterPoint Oklahoma

CenterPoint Oklahoma is a natural gas local distribution company that is part of CenterPoint Energy Resources Corp., an indirect wholly-owned subsidiary of CenterPoint Energy, Inc., a Houston, Texas-based domestic energy delivery company that includes electric transmission and distribution, natural gas distribution, competitive natural gas sales and services, interstate pipelines, and field services operations in multiple jurisdictions. CenterPoint Oklahoma's operations are headquartered in Lawton, Oklahoma.

CenterPoint Oklahoma operates 2,703 miles of gas pipeline in Oklahoma and, at this writing, serves 103,363 customers, including 92,721 residential customers and 10,642 commercial or industrial customers. CenterPoint Oklahoma's service areas are largely rural in nature and do not include either Oklahoma City or Tulsa. CenterPoint Oklahoma provides service in 18 cities in Oklahoma that each have customer counts in excess of 1,000. The largest city served by CenterPoint Oklahoma is the City of Lawton, with 24,028 customers. Figure 17 depicts these 18 cities in CenterPoint's service territory.

Figure 17: CenterPoint Oklahoma Service Territory*



*Cities and towns served with 1,000 customers or greater

Other Regulated Gas Providers

In addition to Oklahoma Natural Gas and CenterPoint, four other small, regulated gas providers serve a limited number of Oklahoma customers.

- Arkansas Oklahoma Gas Co. ("AOG"), based in Fort Smith, Arkansas, has 60,000 Oklahoma and Arkansas customers.
- Fort Cobb Fuel Authority/LeAnn Gas, based in Eakly, Oklahoma serves 3,549 customers in the State. Fort Cobb has purchased several small companies and, although operated under a central management, they are scattered across the State and are considered more like franchises than a coordinated system.
- Panhandle Gas has 78 customers in the rural area around Guymon, Oklahoma.
- West Texas Gas has 4,198 Oklahoma customers in Beaver, Cimarron, Dewey, Ellis, Harper, Roger Mills, Texas and Woodward counties.

Public Sector Utilities

State law does not allow the OCC to regulate any natural gas utility operated by a city. Instead, local governments and/or municipal boards regulate these city-operated utilities. In Oklahoma, at least 45 municipalities operate natural gas utilities. Those that have been identified through their participation in membership associations such as the Municipal Gas Association of America and American Public Gas Association are listed below.

Afton Public Works Authority
 Billings Public Works Authority
 Burbank Municipal Natural Gas Dept.
 Burlington Municipal Natural Gas Dept.
 Chelsea Gas Authority
 Chouteau Public Works Authority
 City of Kaw City
 City of Guymon
 Cleveland Municipal Authority
 Copan Light, Water & Gas System
 Corn Municipal Natural Gas Dept.
 Covington Municipal Natural Gas Dept.
 Drumright Gas Authority
 Dustin Public Works Authority
 East Central Oklahoma Gas Authority

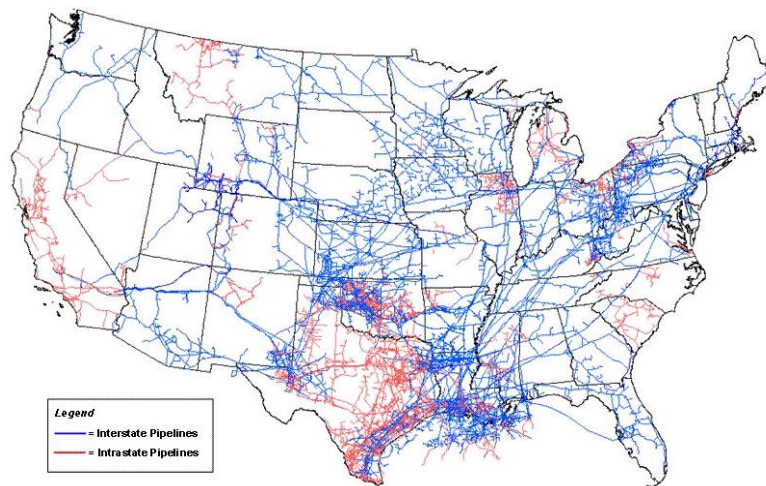
Fairland Gas Authority
 Freedom Gas Distribution System
 Geary Utility Authority
 Grove Municipal Services Authority
 Hallett Municipal Gas Authority
 Hardesty Municipal Natural Gas Dept.
 Haskell Municipal Natural Gas Dept.
 Jay Utility Authority
 Jones City Gas Company
 Keyes Utility Authority
 Kiefer Public Works Authority
 Mannford Public Works Authority
 Minco Gas Authority
 NE Oklahoma Public Facilities Authority
 Orlando Public Works Authority

Pryor Municipal Utility Board
 Ramona Public Works Authority
 Ripley Public Works
 Seiling Public Works Authority
 Sperry Utility Service Authority
 Taloga Municipal Natural Gas Dept.
 Town of Cashion
 Town of Fairfax
 Town of Gate
 Town of Granite
 Tuttle Public Works Authority
 Vici Public Works Authority
 Wakita Utilities Authority
 Wann Public Works Authority
 Willow Natural Gas Dept.

Inter- and Intrastate Transportation of Natural Gas

The majority of natural gas is transported via the complex web of pipelines as shown below in Figure 18. The State of Oklahoma is not responsible for regulation of interstate pipelines within the State. The federal Pipeline and Hazardous Material Safety Administration (PHMSA) is responsible for administering the U.S. Department of Transportation's (U.S. DOT's) national regulatory program to ensure the safe transportation of natural gas, petroleum, and other hazardous materials by pipeline.

Figure 18: U.S. Natural Gas Pipeline Map



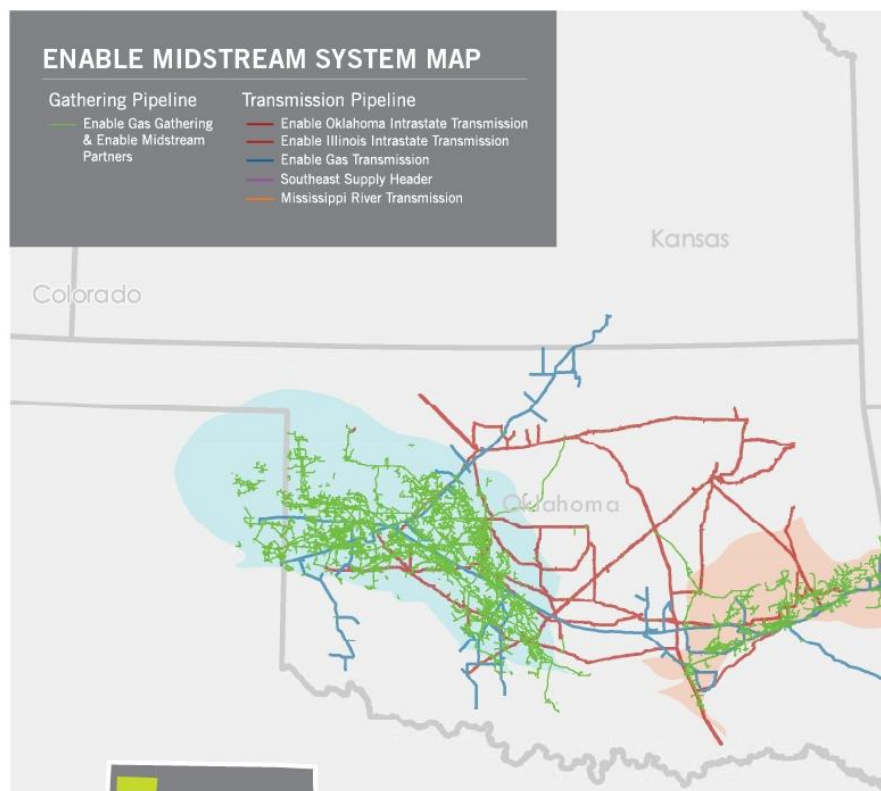
Source: Energy Information Administration, Office of Oil & Gas, Natural Gas Division, Gas Transportation Information System

However, the OCC's Pipeline Safety Department administers an intrastate pipeline regulatory program to assure the safe transportation of natural gas by pipeline. The OCC develops regulations and other approaches to assure safety in design, construction, testing, operation, maintenance, and emergency response to pipeline facilities. The OCC derives its authority over intrastate pipeline operations through State statutes and certification agreements with the U.S.

DOT. The OCC's safety jurisdiction over pipelines covers more than 240 intrastate gathering, transmission, and distribution operators and 16 intrastate hazardous liquid pipeline operators.

Within Oklahoma, there are several major intrastate pipeline networks, including, as shown in Figure 19, Enable Oklahoma Intrastate Transmission, formerly Enogex, an affiliate of the public utility OG&E. As part of Enable Midstream Partners, it provides integrated natural gas midstream services, including gas gathering, processing, transportation, and storage services, primarily in Oklahoma and Arkansas. It operates almost 2,300 miles of intrastate pipeline, eight processing plants, and two underground storage facilities capable of holding 24 billion cubic feet of gas. Enable Oklahoma is connected to third-party gas pipelines which, in turn, transport gas to markets across the United States.

Figure 19: Enable Oklahoma Intrastate Transmission



ONEOK Gas operates a pipeline network that gathers, processes, transports and stores natural gas throughout the State. This pipeline map is shown below in Figure 20. Currently, the network is composed of approximately 18,100 miles of distribution lines that service 840,000 customers. ONEOK has affiliates that operate transmission and storage operations in Oklahoma that include more than 2,500 miles of pipeline and five strategically-located underground storage facilities.

Figure 20: ONEOK Pipeline Network

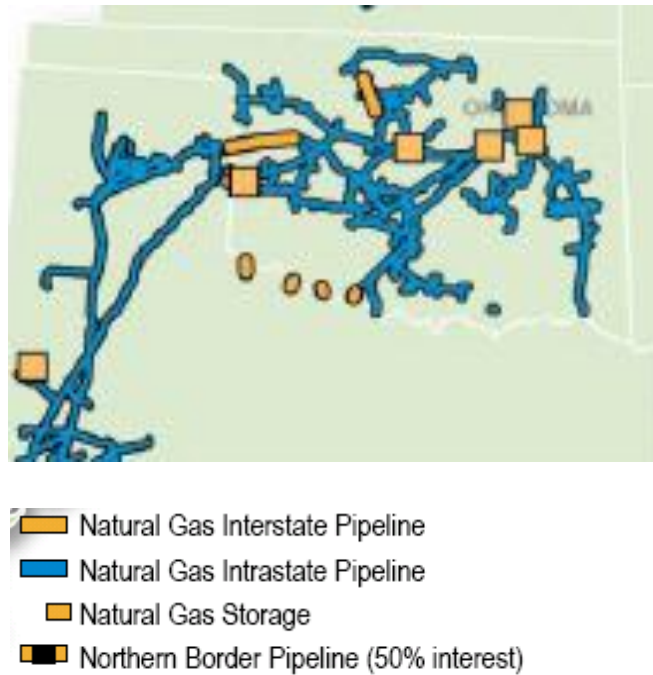
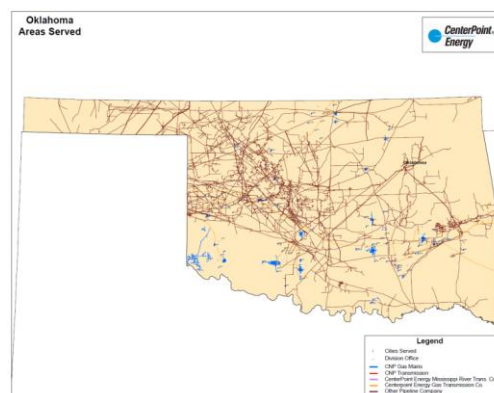


Figure 21 shows CenterPoint Energy-operated gas pipeline and equipment within Oklahoma. CenterPoint Oklahoma operates 2,703 miles of pipeline in the State and serves 103,363 customers, including 92,721 residential customers and 10,642 commercial or industrial customers.

Figure 21: CenterPoint Energy Pipeline Network in Oklahoma



Interstate Natural Gas Pipeline Companies in Oklahoma are:

- ANR Pipeline Co
- CenterPoint Energy Gas Transmission Co
- Colorado Interstate Gas
- El Paso Natural Gas Co.
- KM Interstate Gas Co.
- Mississippi River Transmission Corp.
- Natural Gas Pipeline Company of America
- Northern Natural Gas Co.
- ONEOK Gas Transmission LLC
- ONEOK Gas Transportation System
- Panhandle Eastern Pipeline Co.
- Southern Star Central Gas Pipeline Co.
- Transwestern Pipeline Co.

Trade Associations

In Oklahoma, many trade associations exist to represent the natural gas industry. These organizations are responsible for training, regulatory issues, future planning and industry relations. Although there are myriad organizations to which companies may belong, some of the major natural gas associations active in Oklahoma include:

American Gas Association (AGA)
Mid-Continent Oil and Gas Association
Natural Gas and Energy Association of Oklahoma (NGEAO)
Oklahoma Gas Association (OGA)
Oklahoma Independent Petroleum Association (OIPA)

Energy Efficiency for Natural Gas

The major natural gas providers in Oklahoma offer energy efficiency programs for natural gas. Oklahoma Natural Gas offers residential efficiency rebates for furnace, water heating, or space heating systems, and CenterPoint Energy offers residential and commercial efficiency rebates on these items. Smaller providers in Oklahoma also offer a variety of programs.

Compressed Natural Gas for Transportation

In 2014, Oklahoma had 4,660 registered alternative fuel fleet vehicles on the road in the State. These vehicles were fueled by compressed natural gas (“CNG”), electricity, E85 ethanol, or liquefied petroleum gas. Together these vehicles use nearly one million gallons of alternative fuel annually.³⁸ Moving forward, Oklahoma is pursuing aggressively alternative fuel vehicles for State and municipal fleets, especially CNG vehicles. In October 2012, Oklahoma led an effort to spur demand for additional CNG fleet vehicle purchases by coordinating with over 20 other states to issue a lower-cost RFP to auto manufacturers that will lower the cost premium for the State or municipalities to purchase CNG vehicles.

³⁸ U.S. Energy Information Administration, *Renewable and Alternative Fuels, Alternative Fuel Vehicle Data*, <http://www.eia.gov/renewable/afv/users.cfm?fs=a&ustate=ok&ufueltype=cng%2cevc%2ce85%2chyd%2clng%2clp g%2coth&uyear=2014> (June 7, 2016).

In addition, Oklahoma is developing the fueling infrastructure to support the increasing number of CNG vehicles in the State. As of June 2016, Oklahoma had 97 public CNG fueling stations with another nine stations in the planning phase. Oklahoma has the most public CNG fueling stations per capita in the U.S.³⁹ Complete location and contact information for these stations can be found in Appendix C. In addition, the U.S. DOE's website offers a station locator that can search for privately-owned CNG stations. Alternatively, a CNG station locator is available at <http://www.cngnow.com/stations/Pages/information.aspx>. This website asks the user to identify an address, and then displays the location and price of CNG available in the vicinity of that address.

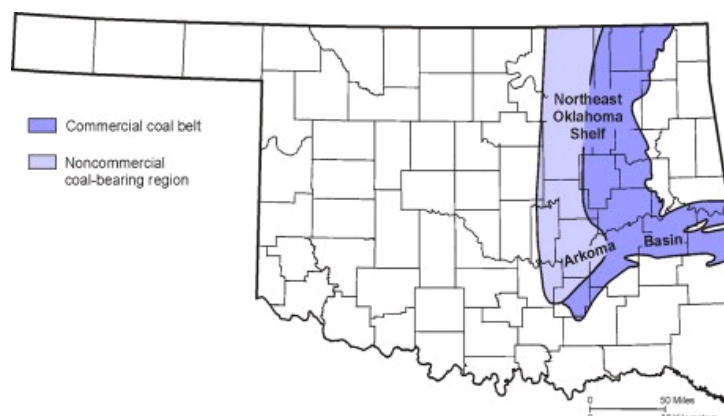
³⁹ U.S. Department of Energy, *Energy Efficiency and Renewable Energy, Alternative Fuels Data Center, Alternative Fueling Station Locator*, http://www.afdc.energy.gov/locator/stations/results?utf8=%E2%9C%93&location=oklahoma&filtered=true&fuel=CNG&private=true&planned=true&owner=all&payment=all&ev_level1=true&ev_level2=true&ev_dc_fast=true&radius_miles=5 (June 1, 2016).

COAL PROFILE

Oklahoma contains a modest amount of coal deposits, which account for 0.5% of the U.S. coal reserves and 0.1% of annual national production. Even so, Oklahoma ranked 21st in the nation for coal production in 2014.⁴⁰ In 2014, Oklahoma coal mines produced approximately 904,000 tons of coal from five mines in four counties. Coal is the fuel source for approximately 40% of the electricity generation in the State. The coal utilized for electricity generation in Oklahoma is primarily from Wyoming and delivered by railcar. As shown in Figure 22, Oklahoma's coal mines are located in the eastern part of the State, and with proper federal and state waivers in place, coal could have potential to serve as a fuel extender in cases of severe shortage.

Oklahoma's coal industry is regulated by the Oklahoma Department of Mines. This department regulates the production of coal and enforces and implements various provisions of State and federally-mandated programs in health, safety, mining and land reclamation practices associated with surface and subsurface mining.

Figure 22: Oklahoma Coal Production Map



Source: Oklahoma Department of Mines, *Oklahoma Coal*,
http://www.ok.gov/mines/Coal_Program/Oklahoma_Coal/index.html (June 1, 2016).

Five companies operate coal mines in Oklahoma. These are:

Brazil Creek Mining
Joshua Coal Company

Farrell-Cooper Mining Georges Colliers, Inc.
Phoenix Coal Company

⁴⁰ U.S. Energy Information Administration, *State Total Energy Rankings, 2014*,
<http://www.eia.gov/state/rankings/?sid=US#/series/48> (June 1, 2016).

U.S. Energy Information Administration, *Table 6. Coal Production and Number of Mines by State and Coal Rank, 2014*, <http://www.eia.gov/coal/annual/pdf/table2.pdf> (June 21, 2016).

PROPANE PROFILE

The Oklahoma LP Gas Administration regulates the propane industry. The Oklahoma Legislature in 1994 created the LP Gas Administration, a/k/a the LP Gas Research, Marketing and Safety Commission, to serve Oklahoma's propane industry and the thousands of propane customers. Its Commissioners are industry representatives.⁴¹ Over the years, the Oklahoma Legislature has proposed merging the LP Gas Administration and its functions into the OCC, but so far no legislation to do that has passed.

In 2014, propane was the primary heating source in 6.7% of the homes in Oklahoma.⁴² The national average for this same year was 4.8%. This difference is due largely to the rural nature of much of Oklahoma, which for many makes natural gas cost prohibitive as a fuel source. Propane is transported in pipelines or via truck for distribution to customers. The major pipelines for propane in the State are operated by:

Conoco	Koch	Phillips
DSE	PDIM	Trans Texas
Exxon		

The National Propane Gas Association is the national trade association representing the U.S. propane industry. Specific to energy assurance, they represent businesses engaged in the retail marketing of propane gas and propane transportation.

⁴¹ Oklahoma LP Gas Research, *Marketing and Safety Commission, Oklahoma Statutes Citationized*, <http://oklpogas.org/documents/OS52Section420.20-Complete-2015.pdf> (June 1, 2016).

⁴² U.S. Energy Information Administration, *Oklahoma State Profile and Energy Estimates*, <http://www.eia.gov/state/data.cfm?sid=OK#EnergyIndicators> (June 22, 2016).

ENERGY VULNERABILITY ASSESSMENTS

This section provides information about events in Oklahoma that have historically caused energy disruptions and outlines potential or known vulnerabilities in Oklahoma’s energy infrastructure that should be considered as part of energy planning and emergency response activities. This information is intended to acquaint officials and stakeholders with potential scenarios, patterns, trends, and frequencies of energy incidents in the State of Oklahoma and to provide a basis for risk scenarios.

Historical Analysis of Energy Emergencies in Oklahoma

The University of Oklahoma’s Center for Risk and Crisis Management (“CRCM”), which conducted a media analysis of reported energy incidents that occurred between January 2011 and December 2015, and compiled a comprehensive history of Oklahoma’s energy emergencies to better understand and plan for likely emergency scenarios. CRCM used Oklahoma’s two major newspapers, the *Tulsa World* and *The Oklahoman*. In all, 173 unique events were documented, with the characteristics listed in Figures 23 through 25.

As listed in Figure 22, electricity incidents are by far the most prevalent, making up 63% of the 173 events. Oil and natural gas incidents accounted for 14% and 23% of the emergency events, respectively. All of the documented energy emergencies fell into these three categories.

Figure 22: Number of Oklahoma Energy Incidents, by Sector, 2011-2015

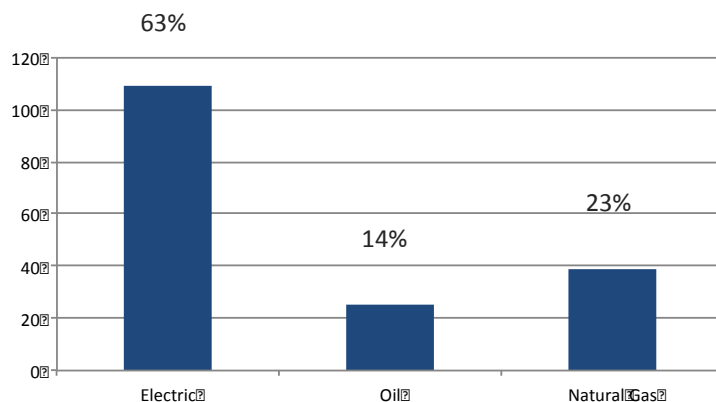
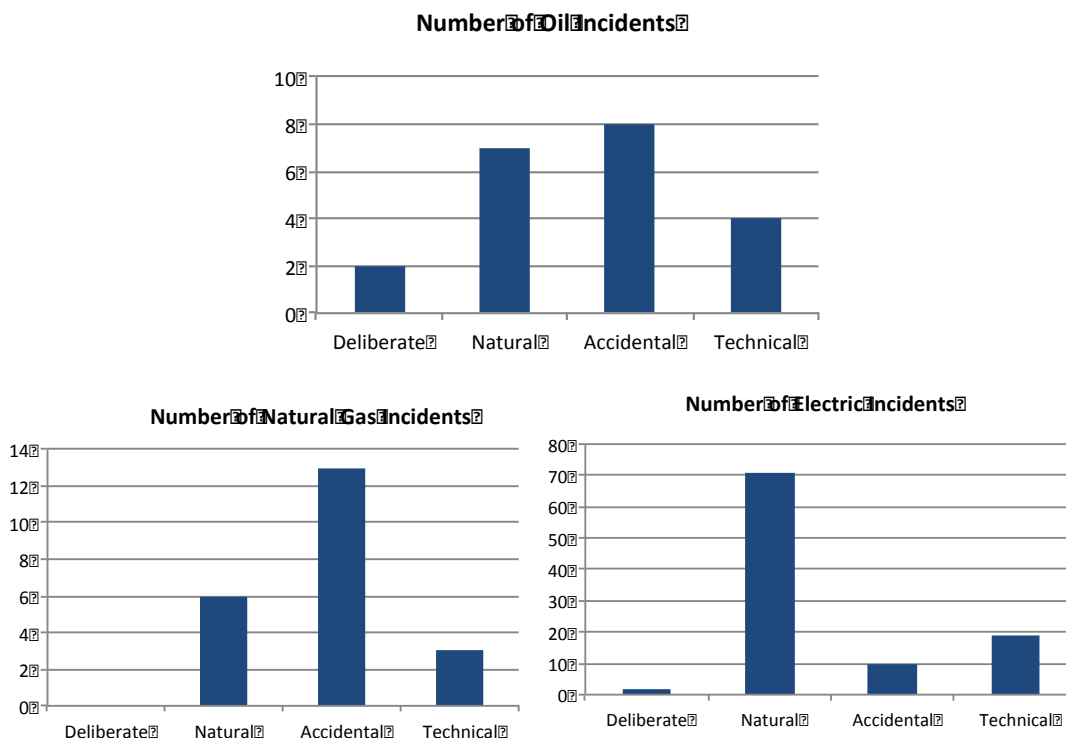


Figure 23 provides a brief look at the cause for each of the 173 energy incidents. Those incidents which did not have a clear source cause reported in the article were not coded. Of the energy incidents with a reported cause, most were accidental or technical in nature. When looking at the oil sectors, most of the incidents were caused by accidents or natural disasters. Four oil events were reported without a specified cause. In the natural gas sector, the causes of 17 incidents were not reported; however, the majority of incidents with a reported cause were

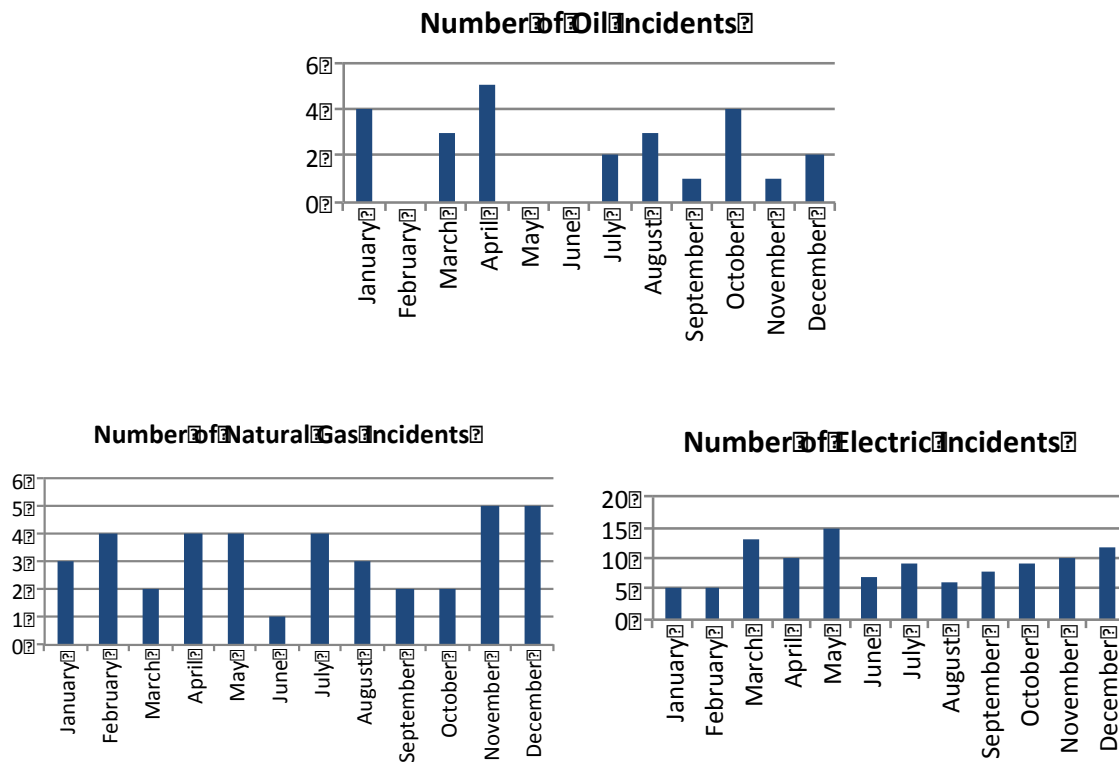
accidental. In comparison, the vast majority of incidents within the electricity sector were caused by natural disasters. Only seven electric incidents were reported without a specified cause.

Figure 23: Number of Oklahoma Energy Incidents, by Sector and Reported Cause, 2011-2015



Next, Figure 24 breaks out each of these events by month. The analysis shows that there is no obvious monthly trend to the occurrence of oil incidents. There were no oil events for the months of February, May, or June during the study period. The majority of natural gas incidents occurred in November and December of that study period. In comparison, the majority of electricity events occurred during the spring (March-May) or during the winter (November-January), perhaps reflecting patterns in the weather. The peak months were in March and May, with 13 and 15 incidents, respectively.

Figure 24: Number of Oklahoma Energy Incidents, by Sector and Month, 2011-2015



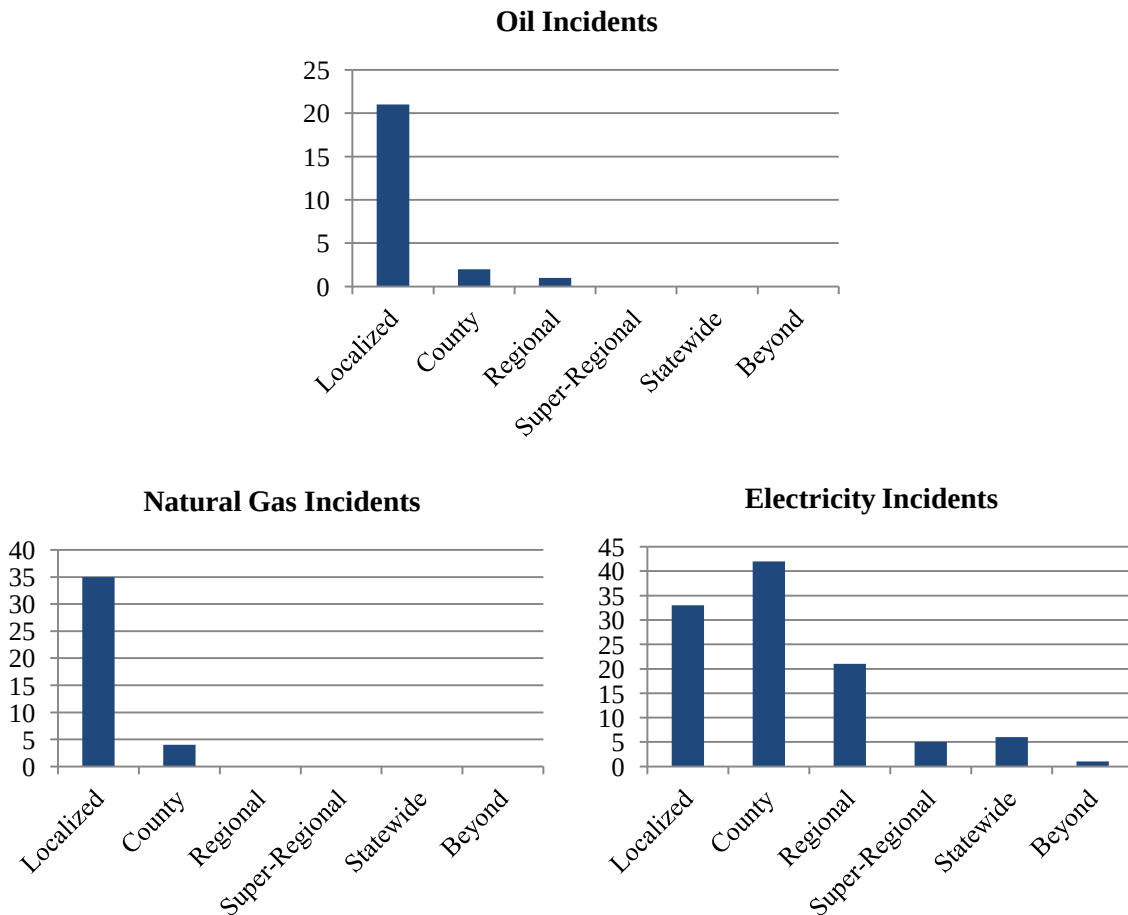
Finally, Figure 25 displays the scope of impact of each energy incident by sector. Incidents with no clear scope reported in the news article were not coded. There was only one incident from each of the natural gas and oil categories with an unreported scope. The data reveals a distinct pattern, which is that natural gas and oil incidents tend to be local in nature whereas electricity incidents range from local to statewide in scope. This fact, combined with the previous analysis, indicates that electricity incidents are the most common type of energy emergency in Oklahoma and also have the potential to affect the largest number of people, making electricity incidents of the highest consequence and probability in Oklahoma. In fact, U.S. DOE reports indicated 12 electric events affecting Oklahoma over a five-year period rose to the standard of required federal reporting.⁴³ Under any of the following circumstances, an electric provider must file a report:

- Physical attack that causes major power interruptions or impacts to critical infrastructure facilities or operations
- Cyber event that causes interruptions of electrical system operations
- Complete operational failure or shutdown of the transmission and/or distribution electrical system

⁴³ U.S. Department of Energy, *Office of Electricity and Energy Reliability, Electric Disturbance Event Summaries, 2002-present*, http://www.oe.netl.doe.gov/OE417_annual_summary.aspx (June 1, 2016).

- Electrical System Separation (islanding) where part/parts of a power grid remain operational in an otherwise blacked-out area or within the area of partial failure of an integrated electrical system
- Uncontrolled loss of 300 megawatts or more of firm system loads for more than 15 minutes due to a single incident
- Load shedding of 100 megawatts or more implemented under emergency operational policy
- System wide voltage reductions of 3% or more
- Public appeal to reduce the use of electricity for purposes of maintaining the continuity of the electric power system
- Physical attack that could potentially impact electric power system adequacy or reliability; or vandalism which targets components of any security systems
- Cyber event that could potentially impact electric power system adequacy or reliability
- Loss of electric service to more than 50,000 customers for one hour or more
- Fuel supply emergencies that could impact electric power system adequacy or reliability

Figure 25: Number of Oklahoma Energy Incidents, by Sector and Reported Scope, 2011-2015



Infrastructure Vulnerabilities by Energy Source

Protecting the State's critical energy infrastructure can be pivotal to preventing at least some energy emergencies, and to protect this infrastructure, an understanding of its inherent vulnerabilities is also important.

Electric Infrastructure Vulnerabilities

Many variables can threaten the complex web of electrical infrastructure, which includes items such as generation facilities, transmission lines, substations, transformers and dams. Potential threats to electric infrastructure include:

- *Deliberate attacks* on the electrical system, which could come in many forms. Almost all electricity infrastructures represent potential targets. Some attacks, such as terrorist actions, may be intended to disrupt electricity networks, while others may be a result of vandalism or crime, such as copper theft, both of which could lead to system failures. Hard-to-replace components of the electric grid, such as custom-built transformers that increase the voltage of electricity to levels suited for bulk transmission and then reduce voltage for distribution to customers, are especially vulnerable. Few of those transformers are manufactured in the United States, and replacing them can take many months.⁴⁴ Furthermore, as the electric grid becomes increasingly automated, it is susceptible to attacks from cyber terrorists. A complete discussion of cybersecurity issues can be found later in this section of this Plan.
- *Natural disasters*, which pose a particularly high risk in Oklahoma. Local distribution infrastructure and transmission lines in particular are severely impacted by the ice storms, winds, lightening, and tornadoes that routinely occur throughout the State. Other threats include floods (often made worse during drought conditions), which can damage all sorts of electric infrastructure and disrupt the hydroelectric system.
- *Accidents*, which pose an additional threat to electric infrastructure in Oklahoma. Transmission lines are particularly vulnerable and can often be damaged by local construction projects or transportation accidents.
- *Systemic threats*, such as a prolonged disruption of electric generation fuel supplies, like natural gas or coal, can disrupt electric providers' ability to meet consumer demand. Further, aging infrastructure can fail, potentially resulting in widespread or prolonged outages.

⁴⁴ Committee on Enhancing the Robustness and Resilience of Future Electrical Transmission and Distribution in the United States to Terrorist Attack; Board on Energy and Environmental Systems; Division on Engineering and Physical Sciences; National Research Council, *Terrorism and the Electric Power Delivery System* (Washington, D.C.: The National Academies Press, 2012).

Natural Gas Infrastructure Vulnerabilities

Similar to the electric infrastructure, it is important to consider the potential threats to Oklahoma's natural gas infrastructure, which includes wells, pipelines, transmission lines, gathering lines, distribution lines, and underground storage facilities.

In Oklahoma, natural gas pipeline operators have undertaken a process to identify their most vulnerable infrastructure and equipment. The list and location of this infrastructure is kept confidential by the operators but the information and analysis is available to authorities as needed. Potential threats to this identified infrastructure might include:

- *Deliberate attacks*, which could affect many portions of natural gas production facilities. Most gas wellheads are in remote low-population areas and are largely unsecured. In addition, intentional damage by either terrorists or vandals could occur. A similar potential exists for the pipeline, processing facilities, pump stations, and ultimately gas meters, all of which are vulnerable to accidents or intentional attacks.
- *Natural disasters*, which are highly probable in this State. Oklahoma is regularly impacted by high winds, wildfires, tornadoes, and lightning, which can damage surface infrastructure. Every 5-10 miles, a natural gas pumping station exists above ground to re-pressurize the lines; these stations are often located in remote areas and are largely unprotected. In addition, Oklahoma has been seismically active, although the cause has been the subject of much research and discussion, and the potential exists for damage to occur from a seismic event, affecting either surface infrastructure or underground pipelines.
- *Accidents*, particularly accidental third-party damage due to excavation during construction. According to the U.S. DOT's Pipeline and Hazardous Materials Safety Administration ("PHMSA"), there are currently 484 miles of natural gas transmission lines and 32,773 miles of gas distribution lines in Oklahoma,⁴⁵ and although this abundance of infrastructure enhances the reliability of and access to gas supply, it also increases the potential for accidents to occur.
- *Systemic threats*, which include pipeline corrosion due to aging infrastructure or a surge in consumer demand that could overwhelm or exceed the capability of the network to provide an adequate supply of natural gas.

⁴⁵ PHMSA Annual Report: Oklahoma, <https://hip.phmsa.dot.gov/analyticsSOAP/saw.dll?Portalpages> (June 21, 2016).

Crude Oil and Petroleum Products Infrastructure Vulnerabilities

Oklahoma's crude oil and petroleum products infrastructure, which includes crude oil production rigs, storage facilities, pipelines, refineries, and fueling stations, face a variety of threats. In particular, Oklahoma is home to the Cushing Crude Oil Hub. Cushing is a major hub in oil supply connecting the Gulf Coast suppliers with northern consumers. Up to 75% of nation's crude oil passes through this junction, supplying significant amounts of oil to the eastern and midwestern portions of the United States. Cushing is surrounded by several tank farms, which makes it a supply and trading hub. (see Figure 26). These tank farms are owned by major petroleum companies including BP, Enbridge Energy Partners, Plains All-American Pipeline, and SemGroup Energy Partners. When combined, the Cushing tank farms can store as much as 74.5 million barrels of oil at a time.⁴⁶ The major pipelines that supply Cushing include Spearhead (90,000 bbl/d), Pegasus (96,000 bbl/d), and Keystone (591,000 bbl/d).

FIGURE 26: AERIAL VIEW-CUSHING TANK FARM



- *Deliberate attacks* could threaten all types of critical petroleum infrastructure. Oil production pumps, storage facilities, pipelines, and refineries are all vulnerable to deliberate attacks. First, crude oil is often stored in aboveground tanks, both at the production sites, tank farms, and refineries. In some cases, tanks are largely unprotected. The State requires a 24-hour emergency number to be posted at each well site, but this is the only State-required asset protection. Additional protection measures are at the tank owner's discretion. These isolated and unsecured tanks, while vulnerable, would pose little impact on the overall supply of energy to the State if they were to be damaged intentionally or otherwise. As at the Cushing Pipeline Hub or in the vicinity of refineries, some areas have high concentrations of tanks. These areas are more secure, but not completely. The State does require additional protective measures at production sites and cities can set more stringent measures if they choose for sites located within urban areas. In addition, according to the U.S. DOT's PHMSA, there are currently 4,052 miles of crude oil pipelines in Oklahoma.
- *Natural disasters* also present a risk to crude oil and petroleum infrastructure. Severe storms, lightning, wind and tornadoes can damage oil production and refinery operations, storage tanks, which could affect supply. Seismic activity also could potentially damage infrastructure.
- *Accidents* are potential risks, particularly for production and pipelines. In particular, accidental pipeline rupture due to unrelated construction digging can occur.
- *Systemic* threats, such as the inability to increase crude oil production and to discover new reserves. Additionally, oil refining capacity may be inadequate to support anticipated increased future demands.

⁴⁶ U.S. Energy Information Administration, *Working Storage Capacity by PAD District as of March 31, 2016*. <http://www.eia.gov/petroleum/storagecapacity/table1.pdf> (June 21, 2016)

Cybersecurity Planning

As energy generation and control systems become more digitally automated, their critical electronic systems, including communications systems, sensors and controls create new vulnerabilities to outside attack. While in the past, interrupting the flow of energy required physical damage, today the same or even greater effects can be achieved by intercepting and altering electronic signals. Innovations such as the “smart grid” in the electric sector and remote or automated meter reading and cutoffs in the natural gas industry allow utilities to increase speed of response, allow more customer choice, and, once service is activated, reduce costs.

However, these “smart” systems also present new challenges, since as energy generation and control systems become more digitally automated, their critical electronic systems, including communications systems, sensors and controls become increasingly vulnerable to outside attack.

In 2015, the number of reported cyber attacks involving critical infrastructure in the energy sector included 46 reported attacks⁴⁷ (not including nuclear reactors), down from 79 in 2014.⁴⁸ Despite this decline, cybersecurity is an ever-increasing factor in system planning and development at the industrial, state, federal and international level. Companies, such as public utilities, must continually improve their system monitoring and protections, while governments at all levels must continue to upgrade security standards. At the international level, conferences are being held with the goal of establishing treaties that may list some items, such as utilities and civilian human needs programs, as off limits to cyber attack.

Currently, many industry standards and federal guidelines exist to help energy providers address issues of cybersecurity. However, these standards are ever-evolving and few are binding. The Energy Policy Act of 2005 created mandatory cybersecurity standards, which were developed by the North American Electric Reliability Corporation (NERC), but these enforceable standards only apply to the electric and nuclear industries. As the issue of cybersecurity becomes more pressing, the federal government is showing increased interest in ensuring that all types of private businesses are ready to meet the challenges of a digital age. In 2012, the United States Congress introduced but failed to pass cybersecurity legislation. In the absence of Congressional action, in February 2013, President Obama signed an Executive Order requiring the National Institute of Standards and Technology (“NIST”) to develop a Cybersecurity Framework that includes standards, methodologies, procedures, and processes that align policy, business, and technological approaches to address cyber risks. The Framework was completed in February 2014. The Executive Order also created a Voluntary Critical Infrastructure Cybersecurity

⁴⁷ U.S. Department of Homeland Security, *ICS-CERT Monitor Newsletter, November-December 2015*, https://ics-cert.us-cert.gov/sites/default/files/Monitors/ICS-CERT_Monitor_Nov-Dec2015_S508C.pdf (June 9, 2016).

⁴⁸ U.S. Department of Homeland Security, *ICS-CERT Monitor Newsletter, September 2014-February 2015*, https://ics-cert.us-cert.gov/sites/default/files/Monitors/ICS-CERT_Monitor_Sep2014-Feb2015.pdf (June 9, 2016).

Program for utilities, transportation and telecommunications firms to adopt the cybersecurity standards outlined in the Cybersecurity Framework.⁴⁹

As standards and regulations continue to develop, the U.S. DOE has worked with electric utilities, in particular, to create an Electricity Subsector Cybersecurity Capability Maturity Model (“ES-C2M2”)⁵⁰, which allows electric utilities and grid operators to assess their cybersecurity capabilities and prioritize their actions and investments to improve cybersecurity, and combines elements from existing cybersecurity efforts into a common tool that can be used consistently across the industry. The ES-C2M2 was developed as part of a White House initiative led by the U.S. DOE in partnership with the Department of Homeland Security and involved close collaboration with industry and other federal agencies.

Other resources currently available to the energy industry to help with cybersecurity planning include the U.S. DOE-issued Electricity Subsector Cybersecurity Risk Management Process (“RMP”) Guideline⁵¹, which helps utilities better understand their cybersecurity risks, assess severity, and allocate resources more efficiently to manage those risks; the Roadmap to Achieve Energy Delivery Systems Cybersecurity⁵², which outlines a strategic framework over the next decade to design, install, operate, and maintain a resilient energy delivery system capable of surviving cyber incidents while sustaining critical functions; the NARUC Cybersecurity Primer for State Regulators⁵³; and the NARUC Critical Infrastructure Committee cybersecurity resolution⁵⁴.

Oklahoma’s major electric and gas utilities are devoting significant resources to planning for and implementing cybersecurity strategies and are integrating these strategies as central in corporate policies.

⁴⁹ Exec. Order No. 13,636, 78 Fed. Reg. 11737 (Feb. 19, 2013).

⁵⁰ U.S. Department of Energy, Office of Electricity Delivery and Energy Reliability, *Electricity Subsector Cybersecurity Capability Maturity Model*, <http://energy.gov/oe/services/cybersecurity/electricity-subsector-cybersecurity-capability-maturity-model> (June 1, 2016).

⁵¹ U.S. Department of Energy, *Electricity Subsector Cybersecurity Risk Management Process*, <http://energy.gov/sites/prod/files/Cybersecurity%20Risk%20Management%20Process%20Guideline%20-%20Final%20-%20May%202012.pdf> (June 1, 2016).

⁵² U.S. Department of Energy, Office of Electricity Delivery and Energy Reliability, *Roadmap to Achieve Energy Delivery Systems Cybersecurity—2011*, <http://energy.gov/oe/downloads/roadmap-achieve-energy-delivery-systems-cybersecurity-2011> (June 1, 2016).

⁵³ National Association of Regulatory Utility Commissioners, *Cybersecurity for State Regulators With Sample Questions for Regulators To Ask Utilities*, <http://energy.gov/sites/prod/files/NARUC%20Cybersecurity%20for%20State%20Regulators%20Primer%20-%20June%202012.pdf> (June 1, 2016).

⁵⁴ Adopted in 2010, the resolution encourages commissions to open a dialogue with their regulated utilities to ensure that these organizations are in compliance with standards, and where applicable, ensure that cost-effective protection and preparedness measures are employed to deter, detect, and respond to cyber-attacks, and to mitigate and recover from their effects. It also encourages commissions to regularly revisit their own cyber security policies and procedures to ensure that they are in compliance with applicable standards and best practices, such as those of the National Institute of Standards and Technology (NIST) and Certification for Information System Security Professionals (“CISSP”). The full text is located at <https://prodnet.www.neca.org/publicationsdocs/wwwpdf/narucresolutions.pdf>.

Cybersecurity Measures in the Electric Sector

Oklahoma Gas & Electric Company

OG&E, the largest electric utility in this State, has an overall cybersecurity plan in place which is layered and based on industry standards (NERC CIP, NIST, and International Organization for Standardization (“ISO”)). The utility has an internal Corporate Security Team, Cyber Security Team, and Physical Security Team that regularly test the utility’s physical and cyber defense strategies, and also conduct security assessments, at least annually, to ensure that if a cyber attack did occur, the utility could restore operations.

The standing security teams in place have identified OG&E’s most critical substations for keeping electricity on, and focus on protecting these assets both physically and from a cybersecurity standpoint. To prevent incidents, the teams monitor proactively for potential threats, including working with the U.S. DOE, and perform threat and vulnerability analyses to evaluate different standards and select the appropriate protective measures.

As an example of its commitment to cybersecurity issues, OG&E has developed a Critical Operations Protection (“COP”) program, which is a cybersecurity protection safeguard specifically for smart grid deployment. The COP program protects the inner workings of the smart grid systems so that hackers are unable to disturb the national electric grid by simultaneously turning off power to many customers. This plan has been reviewed by the U.S. Department of Energy.

Finally, OG&E is working with an electric utility smart grid consortium to discuss common industry security issues, and to direct third party vendors on what new cybersecurity measures to implement and to review annual third-party security testing of the layering approach.

If a cyber event were to occur, as a part of OG&E’s compliance with NERC Critical Infrastructure Protection Reliability Standards, OG&E notifies NERC, applicable Governmental Agencies, and other potentially-impacted electric entities. These requirements are incorporated in OG&E’s policies and Incident Response Plans. OG&E also has Business Recovery and Business Continuance plans to address the potential loss of systems and facilities, and the availability of people to run its critical systems. Additionally, OG&E has Privacy and Confidentiality policies and practices associated with the prevention of unauthorized transfer of sensitive information, including data that has been designated as protected customer information.

Public Service Company of Oklahoma

PSO, which is a division of the utility holding company American Electric Power (“AEP”), utilizes AEP-wide policies in its approach to cybersecurity. AEP’s cybersecurity approach is based on a philosophy that every information asset within the organization must be reviewed and secured in accordance with its criticality and impact to the corporation’s overall operations. AEP policies are built around national and international standards (NIST, ISO) and use a layered approach to security. AEP maintains a dynamic cybersecurity testing program which tests

systems against cyber threats. AEP also emphasizes companywide staff training with annually-required cybersecurity training for all employees as well as quarterly events on timely topics. The company reviews its policies and procedures to ensure that they are up to date and protect its assets against ever-evolving threats.

AEP approaches cybersecurity from an engineering and operations approach. First, engineering staff reviews all technologies before production and with each new version to determine the appropriate balance of security is within business requirements, and then designs solution based on these assessments. Operations staff monitors and controls security once a technology is in production, including log management, day-to-day monitoring, intrusion detection/prevention, and proactively analyzes malware to reduce the threat risks affecting AEP assets.

AEP also hosts a Cybersecurity Operations Center, a joint operation between AEP and Lockheed Martin, to identify and evaluate risks across utilities and report these so that others can take preventative actions. Finally, AEP is a member of a cybersecurity consortium consisting of 6 major utilities that works with third-party vendors to help identify new cybersecurity procedures and techniques.

In the event of a cybersecurity incident, AEP has a mature, documented, and tested Cyber Incident Response process, which includes personal contacts with federal agencies such as the Department of Homeland Security, Department of Energy, FBI, ES-ISAC, and others. AEP is also required to notify its customers if it believes that customer data has been accessed as part of a cyber incident.

Western Farmers Electric Cooperative

Cooperative electric providers are also emphasizing cybersecurity protocols. At WFEC, a dedicated security operations team, which includes a cybersecurity group, monitors WFEC systems and prevents intrusions using the cooperative's written security policy. These protocols are fully compliant with NERC CIP standards. The cooperative also uses third-party vendors to conduct annual cyber vulnerability assessments and participates in Department of Homeland Security and FBI briefings to assist it in monitoring for potential threats.

Further, WFEC has initiated an information protection program, which identifies, marks, and stores separately that information classified as sensitive and confidential. Access is limited, and employees with access receive annual training on appropriate handling of critical information.

In addition to these preventative measures, WFEC has written a Cyber Emergency Response Plan, which is tested annually. This plan ensures that should a cyber attack occur, the cooperative could recover and maintain reliability of service for its member customers.

Grand River Dam Authority

Finally, GRDA, a non-appropriated State agency, is also making investments in cybersecurity. GRDA has cyber and physical security policies in place to protect the reliability of the services it

provides and the equipment it uses to provide them. Because GRDA manages a part of the *Bulk Electric System*, these systems that support reliability of “the grid” must be protected against physical and cyber damage. To do this, GRDA incorporates industry best practices as well as NERC CIP (“Critical Infrastructure Protection”) reliability standard requirements into its security and reliability processes. Its policies address steps taken for protection, support and disaster recovery for its critical cyber systems.

GRDA performs frequent reviews to identify its critical locations and equipment and applies enhanced physical and cybersecurity controls to these assets to protect them from physical or cyber attacks, corruption or loss. GRDA’s cybersecurity teams receive training on current cybersecurity issues and techniques and participate in federal cybersecurity information and alerting systems hosted by NERC, the U.S. DOE, and the FBI.

GRDA physical and cybersecurity teams test security controls on a regular basis, looking for ways to better protect the utility’s systems. Backup systems and incident response plans are tested and improved upon when possible in an effort to streamline responses to problems if they occur. As the cyber threat matrix changes, GRDA makes changes to how it defends against and responds to both physical and cybersecurity risks. This “continuous improvement” approach to both physical and cybersecurity is evolving to meet the emerging threats to reliability.

Finally, GRDA participates in industry cybersecurity conferences, working groups, and peer sharing events to stay informed of security risks. These knowledge-sharing opportunities allow the utility to incorporate industry reliability and security best practices as they develop.

Cybersecurity Measures in the Natural Gas Sector

Oklahoma Natural Gas Company

Oklahoma Natural, a division of ONE Gas, Inc., has had a cybersecurity plan in place for several years using national standards (NIST, ISO) to create a security framework that includes a dozen security domains. These domains include areas such as risk management, information and asset management, and threat and vulnerability management. The plan formulates specific responses for various escalating scenarios that employees can implement should a cyber event occur.

ONE Gas has a standing information security advisory team in place that meets regularly to discuss new and ongoing cyber threats, works with the U.S. Department of Homeland Security and FBI to monitor threats and share information, and also provides in-house security training for Oklahoma Natural employees. The utility also emphasizes third party security by evaluating the cybersecurity processes of its vendors and seeking to include contractual security obligations in its vendor agreements.

As part of its cybersecurity planning, Oklahoma Natural has conducted risk assessments on its electronic assets and, as necessary, has put additional physical security in place to protect these assets. The utility also emphasizes a layering approach for electronic security and utilizes this approach when storing, encrypting, and accessing data.

Finally, Oklahoma Natural also participates in the American Gas Association and the Interstate Natural Gas Association of America, both of which have security working groups.

If a response to a cyber incident is needed, ONE Gas is required to follow all applicable reporting regulations. For example, if the breach involves a loss of Personally Identifiable Information (“PII”), ONE Gas would be obligated to comply with all applicable Oklahoma breach notification laws. Currently, notification of the loss to the affected persons is required by these State regulations. If a breach is detected on a control system network, currently there is no legally-mandated notification requirement. However, in the situation of a material cyber incident, ONE Gas would likely notify and cooperate with various federal government agencies in an effort to both (1) request assistance in evaluating and remediating the control system breach, and (2) allow these agencies to aid other critical infrastructure sector organizations in protecting their own networks. ONE Gas currently has processes in place to recover from breach scenarios involving either PII or control systems.

CenterPoint Oklahoma

CenterPoint Oklahoma, a part of CenterPoint Energy Resources Corp. (“CenterPoint Energy”) has an established cybersecurity policy and set of practices that include customer data protection. The utility also maintains a dedicated corporate staff with primary responsibility for cybersecurity, and requires additional professional certifications for those staff assigned to critical infrastructure assets. CenterPoint’s cybersecurity strategy relies on strategic layering and redundancy approaches for protection against attack and continuity of service should a cyber attack occur.

The development of CenterPoint Energy’s practices involved collaboration with its suppliers, industry associations and regulatory groups, and various branches of the federal government. Examples of these are the American Gas Association (“AGA”), the Interstate Natural Gas Association of America (INGAA), the National Institute of Standards and Technology (“NIST”), the U.S. Department of Energy, the FBI, the Department of Homeland Security, and various national laboratories. In addition, the U.S. DOE has reviewed and approved CenterPoint Energy’s cybersecurity strategy.

Since cyber security threats are constantly changing and evolving, CenterPoint Energy has also partnered with third-party vendors to provide outside expertise that improves the company’s cybersecurity incident response capabilities. As part of these efforts, third-party vendors have conducted penetration testing on CenterPoint Energy’s system.

CenterPoint Energy places a particular emphasis on staff training. Within 30 days of employment, and as an annual education requirement, employees complete and are tested on a Security Awareness Course covering both physical and cybersecurity. The utility also conducts Social Engineering Tests periodically in conjunction with annual IT Security Audits.

In the event of a cyber incident, CenterPoint Energy has detailed response plans in place. If the event involves a service interruption, the utility will use its operational response plans, which include communications between local, state and federal jurisdictions, to restore service. This includes notification to the DHS, DOE, Transportation Security Administration, American Gas Association, Interstate Natural Gas Association of America, and Edison Electric Institute. If computer systems are compromised, the utility has the capability to operate its system manually until electronic systems are restored. In addition, if customer data is compromised, the utility would notify its customers through its cybersecurity insurance policy provider and would also notify local, state and federal consumer-focused agencies.

The service restoration process would differ depending on the type of cyber incident, but it could require isolation of the computer systems from the impacted physical asset(s) via termination of communications and/or isolation of the system. The service restoration would involve manual operation efforts until recovery of computer systems. The computer systems restoration would involve a restore from CenterPoint Energy's back-up and recovery procedures. However, an extremely sophisticated compromise from an advanced persistent threat may require assistance from ICS-CERT as well as highly specialized resources from the computer software provider and other specialized cyber resources provided by consultant experts.

Cybersecurity Measures in the Telecommunications Sector

AT&T and Cox Communications, the largest telecommunications providers in Oklahoma, are active members of the Communications Security, Reliability and Interoperability Council ("CSRIC") that serves in an official advisory capacity to the Federal Communications Commission ("FCC"). The CSRIC was established as a Federal Advisory Committee designed to provide recommendations to the FCC regarding best practices and actions that agency can take to ensure optimal security, reliability, and interoperability of communications systems, including telecommunications, media and public safety communications systems. CSRIC operates under a charter and the charter lasts for two years. Currently CSRIC is under its fifth charter. Under the second charter of the CSRIC, the cyber security working group produced a nearly 150-page manual of best practice to plan for and respond to cybersecurity events. In drafting its report, which was issued in 2011, the working group analyzed existing best practices from leading industry groups including NRIC, NIST, SANS, and IEEE, and recommended modifications and updates to these existing practices based on technology changes, new threats, and other industry developments. AT&T and Cox Communications served as co-chairs of the working group.

A copy of the group's full recommendations for the telecommunications industry can be viewed at <http://transition.fcc.gov/pshs/docs/csrc/WG2A-Cyber-Security-Best-Practices-Final-Report.pdf>.

Under its fourth charter, in March 2015, the cybersecurity working group produced a nearly 450-page report developing voluntary mechanisms that give the Federal Communications Commission (FCC) and the public assurance that communication providers are taking the necessary measures to manage cybersecurity risks across the enterprise. A copy of the group's full report can be viewed at the following online page:

https://transition.fcc.gov/pshs/advisory/csrc4/CSRIC_IV_WG4_Final_Report_031815.pdf.

Response and Communication after Cyber Events

A full discussion of the response mechanisms and communications channels for all types of energy emergencies can be found in the Energy Emergencies Communications Procedures and Mitigating, Tracking, and Responding to Energy Emergencies sections of this Plan. It is, however, important to recognize, that in the aftermath of a cyber event, many electronic communications channels between a utility and emergency planners and responders may be compromised or severed, and alternative methods of communication should be identified as part of each utility's planning process. It also is important to note that all of the major electric and natural gas providers in Oklahoma are registered to use the Government Emergency Telecommunications Service ("GETS").⁵⁵ Participation in this service will help utilities maintain communications channels in the event of an emergency. Cyber events also bring particular potential for automated controls to be compromised and, therefore, restoration may be delayed if manual controls must be utilized to respond to the effects of a cyber event.

In addition, to be fully prepared to respond to a potential cyber event, it is advisable for state emergency planners and utility regulators to meet at least annually with energy providers to ensure that updates to their cyber security plans are captured and that newly released recommendations or regulations are included in these plans.

Regional Transmission Organizations

For several years in the electric industry, Regional Transmission Organizations ("RTOs") have been developing and refining transmission systems that are cost-shared throughout the states in the region. Oklahoma is within the RTO territory of Southwest Power Pool ("SPP"). Increasingly the transmission functions of the member utilities are directed by an RTO or an Independent System Operator. The RTO concept is under the supervisory authority of the

⁵⁵ U.S. Department of Homeland Security. *Government Emergency Telecommunications Service*, <https://www.dhs.gov/government-emergency-telecommunications-service-gets> (June 1, 2016).

Federal Energy Regulatory Commission (“FERC”). The RTO sets the cybersecurity protocol for the multi-state transmission system within its region under FERC supervision.

Today, RTOs are creating a region wide generation economic dispatch system through which individual electric utilities inform the RTO of their expected load for the next day and what generating facilities each utility has available. The RTO then dispatches the various generating units in its region on the basis of which generation is most economically favorable to meet the load across the region and set a market clearing price that the utility receiving power from other generators in the region will be charged for that electricity and that the utility will be paid for electricity that it generated that was provided to other utilities. This includes the use of renewable sources of energy entering the electric system, such as wind, solar and hydroelectric power. A part of its regional responsibilities, the RTO – the SPP in this region – has its own cyber security protections at the multi-state level, with FERC oversight.

Sector Interdependencies

One of the greatest vulnerabilities when planning for energy emergencies is the interdependence within the energy sector among energy sources and between the energy sector and other industry sectors. In any type of energy emergency or supply disruption, there can be downstream consequences that affect other areas of the economy. Thus, planning must take into account scenarios in which energy shortages or emergencies impact other vital industries critical to restoration of normal operating conditions. Some of these scenarios are outlined below.

Downstream consequences of an electrical disruption may include:

- Failure of petroleum supply infrastructure to function
- Outages at refineries and gas processing plants
- Outages of natural gas appliances as restoration of electrical service triggers some pilot lights simultaneously and de-pressurizes gas lines
- Failure of water supply and purification systems to operate
- Failure of information system networks, including wired and cellular telephones
- Failure of 9-1-1 systems
- Failure of environmental control systems, which would result in risk to citizens due to extreme heat and cold temperatures in the State depending on the season
- Failure of retail gas companies to pump gas, as they depend upon electricity for pump function

Oklahoma energy assurance planners should continue to analyze opportunities to lessen interdependencies between the electric sector and other sectors or, at a minimum, have contingency and redundancy plans in place to overcome secondary consequences of an energy supply disruption or emergency.

Future changes to infrastructure that is reliant on electric power could reduce the kind of mutual dependencies that result during power blackouts. For example, more traffic lights could run on high-efficiency L.E.D. lamps and be equipped with batteries to reduce the possibility that during an electric failure, there will also be a loss of traffic signals. Similarly, small generators could be placed in areas where power is needed to pump water, as many rural Oklahoma customers use well water pumped with electric motors and may lose water service when their electricity fails. In addition, the location of large fueling stations can be pre-identified so that in case of electric failure, and resulting gasoline pump failure, battery-powered generators can be quickly delivered to these sites to restore fuel availability for emergency responders and critical needs. During restoration efforts, electric utilities should work collaboratively with natural gas providers to cooperatively bring sections of customers back online so that gas lines are not suddenly depressurized as electric-start pilot lights on furnaces all re-light simultaneously.⁵⁶

To prevent failure of landline telecommunications systems, providers rely on backup batteries located at their central offices. These batteries are periodically charged by mobile generators housed on flatbed trucks. In the case of cellular communications, battery-powered backup generators are utilized at cell towers for short-term outage situations. These towers can also be recharged using mobile generators. In addition, larger cellular providers offer Cellular on Wheels, which involves vehicle-mounted cellular towers that can be moved from location to location as needed. For longer-term outage situations, fuel-based generators sometimes can be installed.⁵⁷

The natural gas utility system is equipped with pumps that run on natural gas instead of electricity so that those systems can survive an extended blackout.

⁵⁶ Cooperation is critical because when gas lines suddenly lose pressure, the natural gas utility may need to go door-to-door to manually check each residence's appliances, since all gas-powered appliances can be affected if a gas line loses pressure. In Oklahoma, this collaboration currently happens between ONE Gas and OG&E—during restoration efforts, ONE Gas embeds an employee in the OG&E restoration field team to coordinate efforts. However, this cooperation is not yet universal between natural gas and electric providers. Universal cooperation is encouraged as a future activity.

⁵⁷ As the general public relies more heavily on cellular communications, how carriers prepare for power outages can be a critical piece of knowledge. Today, many cellular towers have battery-powered backup-power systems that work for eight to 12 hours. However, in times of extended outages, the depletion of these batteries mean that residents relying on cellular telecommunications will be unable to call for assistance from first responders. Fuel-based backup generators can be a solution to this potential concern. One large provider, AT&T, currently has these backup generators at approximately 50% of their towers nationwide. Another major provider, Verizon, has backup generators at most of their towers with a corporate goal to have generators at every cell site. However, carriers and regulators have disagreed over proposed standards for backup power at cellphone antennas. The Federal Communications Commission adopted rules requiring carriers to have a minimum level of backup power, but these rules were successfully challenged in court by cellular providers. Emergency responders should be aware of these potential limitations when planning for communications strategies amongst themselves after electricity outages, and the public should be aware of the potential for extended cellular outages should backup generation not be available.

Downstream consequences of a natural gas disruption may include:

- Loss of electricity generation in the State
- Loss of a primary home heating source in the State (about 60% of homes)
- Loss of fuel source for Compressed Natural Gas (“CNG”) vehicles, an increasing component of government and private fleets as well as a fuel for individual private vehicles.

To reduce downstream consequences from natural gas incidents such as those outlined above, Oklahoma utilities can benefit from a diverse energy and fuel mix. Similarly, diversification of motor vehicle fuel sources, including gasoline and electricity, for public sector fleets should help State and local governments to continue to respond in emergency situations.

Downstream consequences of a petroleum supply disruption may include:

- Transportation disruptions if fuel shortages persist; these disruptions may affect not only Oklahoma but states that rely on Oklahoma’s exported petroleum for their own supplies.
- Disruptions to deliveries of propane by truck to rural customers, thereby creating a secondary energy shortage.
- Inability of diesel-fueled generators to function as backup power sources for critical infrastructure, such as hospitals or cellular towers.

To reduce downstream consequences from petroleum supply disruptions, states should encourage diversity in fuel sources for the transportation sector, perhaps exploring compressed natural gas or biodiesel opportunities for the trucking industry, so that during extended disruptions, fuel deliveries can still occur, even if with less frequency.

ENERGY EMERGENCY RESPONSIBILITIES

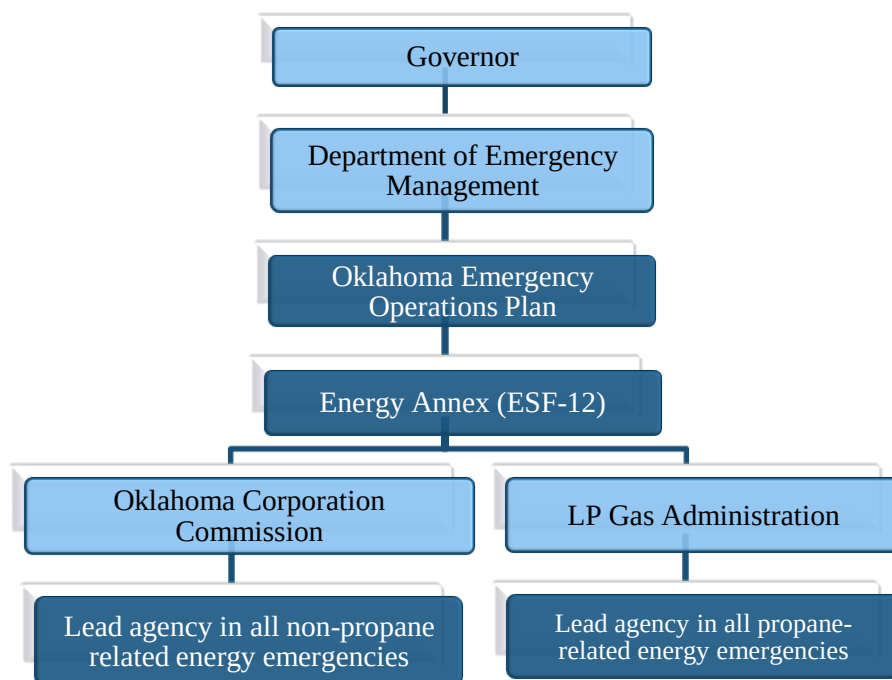
PUBLIC SECTOR STAKEHOLDERS

This section of the Plan identifies the principal governmental agencies and their assigned roles in responding to an energy emergency. These roles, jurisdictions, and responsibilities are derived from both federal and state emergency response frameworks. At the federal level, Emergency Support Function 12, under the *National Response Framework* (“NRF”), delineates the relevant actors and their responsibilities.⁵⁸ In the state of Oklahoma, these responsibilities are spelled out in the *Energy Annex* Emergency Support Function 12 of the Oklahoma Emergency Operations Plan (“EOP”).

State Agencies

There are a number of State agencies which have responsibilities for preventing and responding to energy emergencies. Figure 27 depicts the flow of responsibility, and the section below outlines the specific roles of each agency.

Figure 27: Responsibility for Energy Assurance in Oklahoma



⁵⁸ U.S. Department of Homeland Security, Federal Emergency Management Agency, *National Response Framework*, <http://www.fema.gov/NRF> (June 7, 2016).

Governor's Office

As is the case in all states, the Governor and Governor's office is ultimately responsible for ensuring the health, safety, and general welfare of Oklahoma residents. This responsibility includes responding to energy emergencies. The involvement of the Governor in energy assurance will vary depending on the severity of the emergency. If an energy emergency poses an imminent threat (Level 3 or Level 4) to the residents of Oklahoma, the Governor will become directly involved in the emergency response. The actions of the Governor will also vary on a case-by-case basis. During less severe disruptions, the Governor may simply want to remain informed about events as they unfold. In more severe emergencies, the Governor has the ability to activate the Oklahoma EOP and declare a State of Emergency (which frees up State assets and allows for the temporary suspension of energy laws/regulations that may impede an effective emergency response). The Governor may also elect to coordinate a cross-state response with other Governors, should the emergency impact citizens across state lines. Additionally, the Governor can ask the U.S. President to declare a State of Emergency, which can provide State agencies with access to federal resources. With regard to the Phases of Energy Emergency Management (Figure 1), most of the Governor's involvement will come in Phase III, the response phase.

Oklahoma Department of Emergency Management ("OEM")

As specified in the State's EOP, OEM is the primary emergency response agency in the State of Oklahoma. Accordingly, OEM is intimately involved in responding to all types of energy emergencies that occur within the State's borders. In particular, the Director of OEM serves as the Governor's Authorized Representative, which enables him/her to act, as necessary, on behalf of the Governor when coordinating with the Department of Homeland Security and FEMA for all federal assistance requirements. Likewise, OEM organizes and manages the State Emergency Operations Center ("EOC"), which is a centralized facility to be utilized by the government for direction, control, and coordination in an emergency. Finally, OEM is responsible for communicating and coordinating with city and local governments in the event of an energy emergency. With regard to the Phases of Energy Emergency Management (Figure 1), OEM's involvement will cut across each phase, but will be most prominent during Phase III, the response phase.

Training is an ongoing activity coordinated through OEM, sometimes in conjunction with federal agencies such as FEMA and the Department of Homeland Security. Through the use of tabletop exercises and other activities, OEM and its coordinating agencies demonstrate their ability to activate and staff the Emergency Operations Center, identify and implement the appropriate response to the emergency situation, and provide information to the public through the Emergency Alert System and public inquiry hotline. Governmental agencies at all levels and spokespersons for the involved industries coordinate responses and develop effective public information messages.

Oklahoma Corporation Commission (“OCC”)

As specified in the Oklahoma EOP Emergency Support Function¹² and represented in Figure 27, the OCC, which is responsible for regulating public utilities, is the lead agency for all energy emergencies, except those incidents related to Liquefied Petroleum Gas (also known as LP gas or propane). During emergencies involving petroleum, the LP Gas Administration becomes the lead agency. As the lead agency for energy emergencies, the OCC is involved in all four phases of energy management. Oklahoma is unique in that the OCC regulates the widest breadth of industries of any public utility commission in the nation. The OCC regulates public service companies in the electric and natural gas industries as well as pipeline safety, oil and gas exploration and production, as well as railroad crossing safety and aspects of telecommunications and trucking. Because of its wide purview and the relationships between these industries, the OCC is singularly qualified to serve as the lead in responding to energy emergencies and coordinating with OEM and all energy-related stakeholders to restore normal energy operations to the State. As the State agency most involved with energy regulation, the OCC has a permanent seat at the table within the EOC, from which it may communicate directly with the State’s public utilities, operators of fuel supply outlets and oil and natural gas companies.

Phase I: Monitor and Alert

During Phase I, the OCC is responsible for carefully monitoring the flow of energy throughout the State. This task is divided into two different schemes, one for monitoring service interruptions and one for monitoring the supply and demand dynamics that interact to generate supply shortages. With regard to the monitoring of interruptions, the OCC is in constant contact with energy companies that are legally required to notify the OCC of unplanned service interruptions (OAC 165:35-19-4 for electric utilities; OAC 165:45-21 for natural gas utilities; OAC 165:65-9-2(1) and OAC 165:55-25 for telecommunications). If an energy company does not report an outage, the OCC also receives a continuous stream of information from OEM, which receives information about service interruptions from local emergency managers.

Phase II: Assess and Determine Action

Having noticed early signs of what might become an energy emergency; the OCC intensifies its data and information collection efforts in Phase II. With regard to service interruptions, this involves communication with additional sources and potentially sending local agents to the field in an attempt to collect more information. This information is then communicated to the governmental agencies following the channels listed in Energy Emergency Communications Procedures section of this Plan.

Phase III: Actions and Feedback

If an energy emergency is severe enough to warrant government action, Phase III of Energy Emergency Management is initiated, where the governmental agencies begin to consider

response measures. Specifically, the OCC has the following responsibilities, specified in Emergency Support Function¹² of the Oklahoma EOP:

- Upon request by the OEM, provide an agency representative or agency coordination officer to the State EOC to assess and coordinate the repair of damaged utilities and the redistribution of energy assets. As of this writing, OCC's representative is the agency's Public Information Officer.
- Request unaffected telephone, gas, and electric companies to provide emergency repair crews and equipment to assist affected utility companies to restore service as quickly as possible.
- Keep a record of reports on damaged utilities, requests for damage repair assistance, repairs completed, and any other events or activities deemed necessary for the record. Document the incidents with photographs, videos, and data from the Global Positioning System when possible. Copies of the reports will be provided to the State EOC.
- Contact area utility companies for damage reports. If the utilities require additional assistance, the coordinator will work through supporting groups for additional information and requirements.
- Additional responsibilities include to conduct safety inspections at rail crossings, investigate derailments of trains carrying hazardous materials, determine the safety of pipelines carrying natural gas and hazardous materials, provide technical assistance and check for petroleum pollution, and assess the safety of aboveground and underground fuel storage tanks.

Phase IV: Review Lessons Learned

During Phase IV, which involves a reviewing the lessons learned during the energy emergency, the OCC internally reviews its reports of the damaged utilities, the requests for damage repair assistance, the repairs completed, and the extent to which its responses facilitated or inhibited the alleviation of the emergency situation. Then the OCC participates in an "After-Action Report Meeting" which is organized by OEM to review the emergency situation as a whole.

Additional Supporting Agencies and Organizations

Due to the inherent complexity associated with energy emergencies, a number of other State agencies and non-governmental organizations play an essential supporting role in each of the four emergency phases. With regard to the response itself (Phase III), the EOP ESP-12 lists the following supporting groups:

- | | |
|---|---|
| ○ American Red Cross (ARC) | ○ Department of Environmental Quality (DEQ) |
| ○ Department of Health (OSDH) | ○ Department of Human Services (OKDHS) |
| ○ Department of Public Safety (DPS) | ○ Department of Transportation (ODOT) |
| ○ LP Gas Administration | ○ Oklahoma Office of Homeland Security (OKOHS) |
| ○ Oklahoma Military Department | ○ Oklahoma State Bureau of Investigation (OSBI) |
| ○ Oklahoma Water Resources Board (OWRB) | |

Each of these agencies is responsible for providing assistance as requested during the response phase. The type of assistance provided by each identified agency is as follows:

- ARC will provide support as necessary to victims during response and recovery phases, including setting up shelters in areas where utility service has been interrupted.
- DEQ will provide guidance and support to the response and recovery of material associated with hazardous material incidents (except as provided by the OCC) in accordance with state regulations.
- OSDH will provide damage assessment assistance to the State, county, and local jurisdictions with respect to health care facilities and their energy needs, and will provide support as necessary to ARC and other voluntary organizations for immediate needs of victims, e.g., those on life support systems, and continue long-term support of victims during recovery efforts.
- OKDHS will provide support as necessary to ARC and other voluntary organizations for immediate needs of victims, e.g., those on life support systems, and continue long-term support of victims during recovery efforts.
- DPS will provide support as required.
- ODOT will provide support as required.
- The LP Gas Administration will become the lead agency for energy emergencies involving liquefied petroleum gas. Additionally, the LP Gas Administration will assist with rerouting and redistribution of LP gas resources as requested.
- The Oklahoma Military Department, the administrative agency for the Oklahoma National Guard, when requested, will use its forces to assist ODOT in making emergency repairs to roads, bridges, public buildings, or other public facilities in disaster areas, which are essential to the health, safety, and welfare of the public and the transportation of energy-related materials.
- OKOHS will provide support as required.
- OSBI will provide support as requested.
- OWRB will gather information on damage to dams and associated power generation plants throughout the affected area. The OWRB will also gather information on damage to structures that are within the regulated floodplains in affected areas.

Oklahoma Department of Mines

It is important to also note that, although it is not listed with formal responsibilities in the State's Emergency Operations Plan, the Oklahoma Department of Mines holds responsibility for overseeing the State's coal industry, including receiving reports of mine accidents or supply interruptions.

Other Sheltering Agencies

Also outside of formal Emergency Support Function¹² responsibilities, yet still a vital component, many other social service agencies hold responsibilities for response during energy emergencies. If the energy emergency requires shelter victims, many nonprofit and faith-based organizations offer feeding and shelter. In times of need, the Oklahoma Department of Emergency Management coordinates with Oklahoma Voluntary Organizations Active in Disaster (OK VOAD)⁵⁹, which is an umbrella agency whose purpose is to bring together organizations to foster more effective response to the people of Oklahoma in times of disaster. OK VOAD agencies are The American Red Cross, The Salvation Army, food banks, volunteer centers and most faith-based groups that provide disaster aid and assistance as part of their mission.

Local Agencies

By law, all incorporated jurisdictions in Oklahoma are required to develop an emergency management program and each county is required to have a qualified emergency management director. The Oklahoma Emergency Management Association is made up of emergency managers from across the State, with a mission to minimize the effects of an attack, technological and natural disasters, and to coordinate emergency response and disaster recovery operations. The emergency managers for each county are also in regular contact with the State's OEM.

Federal Agencies

The U.S. DOE is the lead federal agency when the Department of Homeland Security DHS/FEMA activates Emergency Support Function¹² in the National Response Framework at the federal level. As specified in Emergency Support Function-12, the DOE is responsible for:

- Serving as the focal point for issues and policy decisions relating to energy response and restoration efforts
- Assessing energy system damage and monitoring repair work
- Collecting, assessing, and providing information on energy supply, demand, and market impacts
- Contributing to situation and after-action reports
- Identifying supporting resources needed to restore energy systems
- Deploying DOE response teams as needed to affected area(s) to assist in response and restoration efforts
- Reviewing and sponsoring the energy industry's requests for Telecommunications Service Priority ("TSP") assignments to provision new services.

⁵⁹ National Voluntary Organizations Active in Disaster, *Committee's Work Site*, <https://nvoad.communityos.org/cms/> (June 22, 2016).

Likewise, DOE maintains the following capabilities to meet Emergency Support Function requirements:

- Collects and reports to Congress information filed by electric energy generators, transmitters and distributors regarding loss of firm load, system voltage reductions or public appeals, bulk system operational actions and fuel supply emergencies
- Assists in the development of state and local energy recovery priorities
- Assists affected energy stakeholders in dealing with the FEMA by coordinating with electric, gas, and telephone providers in applying for FEMA cost sharing for repairs
- Assists affected energy stakeholders in obtaining repair crews and materials from outside the affected areas
- Acts as an ombudsman in conjunction with State energy and emergency agencies to obtain electric power
- Gives restoration priority to communications, public works (water, sewage), and ancillary energy facilities, e.g., fuel transportation/distribution systems, pipeline pump stations, refineries
- Handles requests for unique department assets to support an energy emergency response
- Maintains the DOE Emergency Operations Center (“EOC”), which is open twenty-four hours a day, seven days a week. The EOC can be reached by telephone Voice: (202) 586-8100, FAX: (202) 586-8485, or by email at hqdoe@oem.doe.gov.

In support of DOE, a number of other federal agencies are authorized by the National Response Framework to provide assistance during an energy emergency. These agencies include:

- | | |
|---|---|
| • Department of Agriculture (USDA) | • Department of State (DOS) |
| • Department of Commerce (DOC) | • Department of Transportation (DOT) |
| • Department of Defense (DOD) | • Environmental Protection Agency (EPA) |
| • Department of Homeland Security (DHS) | • Nuclear Regulatory Commission (NRC) |
| • Department of the Interior (DOI) | • Tennessee Valley Authority (TVA) |
| • Department of Labor (DOL) | |

In general, these agencies are responsible for supporting both the DOE and state governments in responding to energy emergencies. For example:

USDA can provide support on issues related to propane for crop drying and protecting livestock. Likewise, the Rural Utilities Service (“RUS”), which is housed at USDA, is responsible for funding and tracking energy consumption information for rural electric cooperatives.

DOC provides data that assists in understanding emergency threats and monitoring the international flow of oil. The Mineral Management Service (“MMS”) and the NOAA are part of DOC. MMS oversees offshore oil and gas production in the Gulf of Mexico, and NOAA provides up-to-the-minute tracking of hurricanes, wildfires, winter storms, and other weather-related emergencies.

EPA may need to be contacted if waivers are sought for fuels that do not meet national and local air quality requirements. A fuel waiver can be issued only when the criteria specified in the Clean Air Act Section 211(c)(4)(C) have been met. In general, these criteria allow a fuels waiver only to address a temporary emergency fuel supply shortage that exists throughout a state or region that was caused by an unusual situation such as a natural disaster and that could not have been avoided by prudent planning.

DOT has several subagencies that may relate to an energy emergency, including:

- Pipeline and Hazardous Materials Safety Administration (PHMSA)
- Federal Highway Administration (FHWA)
- Federal Maritime Administration
- Federal Motor Carrier Safety Administration
- Federal Aviation Administration (FAA)

In addition, new requirements have recently been added instructing the Federal Communications Commission (FCC) to give priority to certain restoration activities, such as those conducted by FEMA.

Industry Stakeholders

The State's EOP Emergency Support Function¹² names four energy industry support groups for energy emergency situations: regulated investor-owned utilities, the Oklahoma Association of Electric Cooperatives ("OAEC"), the Oklahoma Telephone Association, and the Municipal Electric Systems of Oklahoma ("MESO"). The section below outlines their respective roles.

Regulated Investor-Owned Utilities

Regulated investor-owned utilities in Oklahoma are legally required to notify the OCC of unplanned service interruptions (OAC 165:35-19-4). In addition, each utility must file a Restoration of Service Plan with the OCC. A detailed discussion of these measures can be found in the Energy Emergency Communications Procedures section of this Plan.

In an energy emergency, further responsibilities for utilities include active communication with the OCC in terms of status updates on outages, damage reports, and damage repair assistance to other utilities as requested by the OCC.

Oklahoma Association of Electric Cooperatives

OAEC is a statewide association of local electric distribution and generation/transmission cooperatives. OAEC has 30 members, 28 of which are based in Oklahoma and two of which are based out-of-state but with Oklahoma membership components. OAEC allows its members to collectively perform services which would not be practical or economical for each individual cooperative to perform alone, including activities such as providing safety and loss control programs and coordinating mutual aid disaster planning.

In an energy emergency, OAEC leadership will serve as a liaison group and communicate with the OCC and OEM to provide information about its members' outages, restoration of service updates, and any mutual aid activities.

Oklahoma Telephone Association

The Oklahoma Telephone Association represents local exchange carriers around the State. The Telephone Association's main support role as it pertains to energy emergencies is to provide information regarding its members' telephone outages to the OCC and OEM and to coordinate mutual aid activities between member companies that may be experiencing outages. Non-member companies may report such information pertaining to their operations independently.

Municipal Electric Systems of Oklahoma

Municipal Electric Systems of Oklahoma ("MESO") is a statewide trade association for Oklahoma's 63 municipally-owned electric distribution utilities, which serve over 400,000 Oklahoma residents.

Similar to the other support groups, MESO coordinates mutual aid services and agreements for its member utilities, and in the event of an energy emergency, MESO would serve as a contact organization for State officials to provide information on member outages and restoration updates.

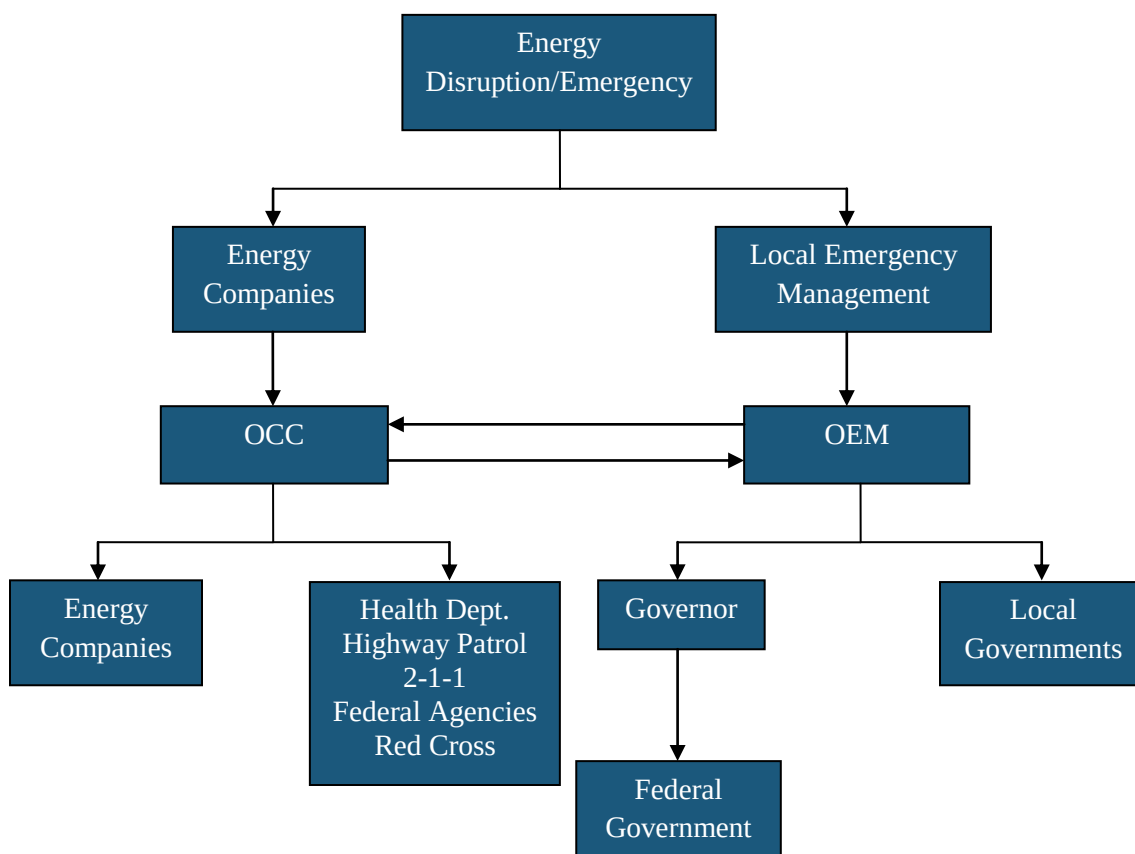
ENERGY EMERGENCY

COMMUNICATIONS PROCEDURES

INTERNAL COMMUNICATIONS

This section of the Plan documents the procedure for internal communications among federal, state, regional, and local agencies, and energy companies during an energy emergency. The communication of timely and accurate information is a critical part of energy assurance in Oklahoma, and an effective Energy Assurance Plan must include a method for reporting on and tracking unforeseen and/or unplanned energy outages. As displayed in Figure 28, which shows the flow of information in an energy emergency, energy companies and local emergency managers report the vast majority of information about energy disruptions and emergencies to State officials. Within the State government, there are two hubs that relay this information to the appropriate decision makers — the OCC and OEM.

Figure 28: The Flow of Information during an Energy Emergency in Oklahoma



First, regulated energy providers in Oklahoma are required by the Oklahoma Administrative Code – OAC 165:35-19-4 of the OCC Electric Utility Rules and OAC 165:45-9-2.1 of the OCC Gas Utility Rules – to provide Restoration of Service plans annually to the Director of the OCC Public Utility Division’s Consumer Services Section. These Restoration of Service plans must outline detailed steps for responding to outages and must include detailed contact lists for each regulated company, including a minimum of two 24-hour a day contacts. These plans provide State officials with the information they need to plan for and respond to energy emergencies that affect Oklahoma residents. Once the Commission receives each company’s plan, the OCC Public Information Officer maintains these plans and acts as the point of contact for utilities that are required to report unplanned outages. Upon receiving any report of outage or emergency from an energy provider, the OCC’s Public Information Officer is responsible for contacting other State and local agencies that might be affected.

In addition to tracking electric and gas outages, it is important to track the flow of energy via pipelines throughout the State of Oklahoma. Accordingly, the OCC has created an additional set of rules to govern the actions to be taken by energy providers in the event of a pipeline incident. OAC 165:20-5-1 requires telephonic notice to the OCC Pipeline Safety Department no more than two hours following any pipeline incident that involves release of gas from a pipeline and either a death, personal injury requiring hospitalization, damage of \$5,000 or more, or any other event that is significant in the judgment of the operator.

Once the Commission receives information about any energy incident, the agency is responsible for relaying the appropriate information about outages or pipeline incidents to the OEM and other energy companies, as well as a list of potentially-affected State agencies/organizations, including the Department of Health, Highway Patrol, the 2-1-1 general information line, the Federal Executive Board, and the Red Cross. The OEM, when it receives information from local emergency managers, communicates it to the OCC, the Governor’s office, and back to the local governments that are affected. Should the energy emergency warrant federal involvement, the Governor’s office, or the Director of the OEM, is responsible for communication with the federal government.

In addition, Oklahoma has five individuals who serve as Energy Emergency Assurance Coordinators. These individuals, each having planning and response responsibilities during energy emergencies, are registered on a password-protected ISERnet (Infrastructure Security and Energy Restoration Internet) website hosted by the U.S. Department of Energy, which allows Oklahoma’s key energy emergency planners to receive energy updates from federal agencies and communicate information to other states and the federal government when authorized by the Governor, Director of the OEM or other key state decision makers. These five Oklahoma individuals are the Deputy Director of Office of Emergency Management, the Public Information Officer of the OCC, the Chief of Energy in the Public Utility Division of the OCC, the Director of the State Energy Office within the Oklahoma Department of Commerce, and the Oklahoma Deputy Secretary of Energy.

To ensure the continued flow of information, the Commission's Public Information Officer remains in contact with the applicable State agencies and utilities during energy outages and based upon these updates will periodically release reports on the status of the outage. Status reports are released daily or whenever a significant change in the condition of the outage occurs, which means multiple reports could be released in a single 24-hour period. The OCC's Public Information Officer, when appropriate, will provide updates to the print, television and radio media so that the general public is informed as to the status of the outages and the progress of restoration efforts.

Contact information, including personal email addresses, work, home and cell phone numbers, for each of the individuals/entities listed in the aforementioned paragraphs can be found in the Oklahoma Energy Emergency Contact list, which is maintained and updated by the OCC Public Information Officer/Liaison to the OEM. As new energy incidents present themselves, all of the people/entities who are contacted during the event are added to the contact list. The list is updated every year by the OCC to ensure that the content is accurate.

For the internal flow of communications to be successful during an energy emergency, it is critical that utilities are able to maintain contact between their on-the-ground crews, the utility offices, and State and local officials. To assist in this, most of the major electric and gas utilities in Oklahoma have registered to use the Government Emergency Telecommunications Service ("GETS"). As of this writing, OG&E, AEP-PSO, CenterPoint Oklahoma, and ONE Gas (Oklahoma Natural) have all indicated that they are registered with GETS.

The Government Emergency Telecommunications Service is a White House-directed emergency phone service provided by the National Communications System ("NCS") in the Department of Homeland Security. GETS provides emergency access and priority processing in the local and long distance segments of the public switched telephone network ("PSTN"). GETS is intended to be used in an emergency or crisis situation when the PSTN is congested and the probability of completing a call over normal or other alternate telecommunication means has significantly decreased. GETS allows users to communicate over existing PSTN paths with a high likelihood of call completion during the most severe conditions of high-traffic congestion and disruption. The result is a cost-effective, easy-to-use emergency telephone service that is accessed through a simple dialing plan and Personal Identification Number (PIN) card verification methodology. It is maintained in a constant state of readiness as a means to overcome network outages through such methods as enhanced routing and priority treatment.⁶⁰

⁶⁰ U.S. Department of Homeland Security. *Government Emergency Telecommunications Service*. <https://www.dhs.gov/government-emergency-telecommunications-service-gets> (June 1, 2016).

EXTERNAL COMMUNICATIONS

This section provides an overview of how communication with the media will be handled during an energy emergency and who will be responsible for addressing the press and/or general public. In the event of an energy emergency, accurate and timely public information helps to prevent confusion and anxiety and limits uncertainty.

Emergency Support Function-15 of the Oklahoma EOP provides the framework for Oklahoma's public information program protocol to be followed during all types of emergencies. The OEM is Oklahoma's coordinating agency with support from all State agencies, boards, commissions and voluntary organizations. The primary purpose of the public information function is to provide and maintain operational consistency throughout the State of Oklahoma in the form of emergency information, providing accurate information to legislative and congressional delegations and community relations. Uniform information coordination with these groups will help Public Information Officers (PIOs) for State, county and municipal entities to provide information to citizens in a responsive, well-managed manner during emergencies and disasters. Each of the PIOs is responsible for speaking about their agency's involvement in managing an energy emergency. As an ongoing measure, PIOs and key operations officials from all levels of government meet monthly to facilitate ongoing communication and relationships and, in addition, OEM offers training classes for communications personnel that meet FEMA certification standards.

State Information Flow

During energy emergencies, the Governor's office will serve as the focal point of communication with the public. Accordingly, the OEM PIO will work closely with the Governor's Press Secretary to assure that the Governor has timely access to accurate information.

To ensure the accuracy of information across governmental agencies, a Joint Information Center ("JIC") operation will be set up at one of three locations – the State Emergency Operations Center, the media center set up at the site of the incident, or at a Joint Field Office. The JIC will be the primary field location to coordinate federal, State, and local media relations. The JIC will collect information and disseminate it according to the Joint Information System ("JIS").

Alternative Outlets for Information Flow

To disseminate public information, governmental agencies may consider setting up information booths at the disaster sites themselves, may contact media, and/or may establish broader public education programs. The appropriate tool for information dissemination depends upon the energy emergency itself. Additional mechanisms of dissemination might include:

- Cable channels and/or satellite uplink operations
- Special publications
- Radio feeds
- Special projects such as teleconferencing
- Social media

Communications Integration

It is recommended that all public affairs elements be integrated into the JIS on a daily basis where possible. In the event of an emergency or disaster, other entities may be required to add to the public information efforts as the event demands. If a JIC is established, all PIOs should be integrated.

Concept of Operations

During statewide emergency operations, the OEM has the primary responsibility for providing emergency public information and general information. To accomplish this responsibility, the Director of the OEM will appoint or designate a State Emergency Information Officer. It is the responsibility of this Officer to prepare and release emergency information as provided by the OEM Director and/or the Governor. The State Emergency Information Officer will prepare a broad scope of information as provided by the OEM Director and/or Governor. The State Emergency Information Officer will also prepare a broad scope of information for use by the news media. The pertinent information and situation reports will be prepared, with the OEM Director's approval, for the Governor, the Emergency Alert System, and/or the news media as appropriate. In close coordination with the Governor's Press Secretary and involved agency PIOs, this group will approve, coordinate, and release all emergency information from State agencies and serve as the focal point for all inquiries by the media.

The State Emergency Information Officer is responsible for providing the public, via the news media, with accurate and timely information about emergency and disaster response and recovery operations. This will reduce or eliminate inaccurate information that may arise and will facilitate delivery of vital emergency and disaster information to the citizens of the State of Oklahoma.

The PIO must be present at every event that might attract media attention or that would serve as an opportunity to get information to disaster victims and to publicize the local and State emergency or disaster status, recovery and relief message. The early activation and deployment of a PIO along with other response personnel as part of emergency operations field deployments, or as part of the preliminary damage assessment team and other pre-declaration activities is vital to effectively alleviate concerns about local and State government responsiveness and to provide victims with accurate information during every step of the process.

If a Presidential Declaration has been made, the JIC will be expanded to include federal resources, such as FEMA and the U.S. Army Corps of Engineers, which may be a part of a JIC during a flood emergency, operating on their own authority. With an expanding JIC established, field PIOs must continue their visibility in the affected communities, especially where Disaster Service Centers have been established. The JIC then becomes the central point for media access to the latest developments and emergency information for all participating agencies. The JIC supports field PIO operations by providing updated information about current policies and issues regarding response and recovery operations.

PIOs in the JIC work closely with elected officials, response agencies, and emergency managers. JIC PIOs are responsible for establishing daily news briefings for key disaster officials, writing and disseminating news releases to appropriate media outlets, monitoring and analyzing television, radio and newspaper disaster news coverage, providing this information to the JIS, and providing multilingual media support operations regarding the disaster as appropriate based on the community need.

The information collection and dissemination process will conform to the following phases of energy emergency management:

- Phase I: Monitor and Alert
 - Conduct public awareness programs
 - Coordinate with public and private sector partners and the media
- Phase II: Assess and Determine Action
 - Conduct public education programs
 - Prepare external affairs plans and exercise those plans
- Phase III: Actions and Feedback
 - Release public information
 - Coordinate rumor control
 - Schedule news conferences and other events
 - Handle legislative and Congressional inquiries
- Phase IV: Review Lessons Learned
 - Provide public information
 - Handle legislative and Congressional inquiries
 - Provide community relations
 - Compile records of and document event
 - Assess effectiveness of information and educational programs

Resource Requirements

The resource requirements, which include staff, equipment, office supplies, and office facilities, should be tailored to the type and magnitude of the emergency prompting the response. Depending on the nature of the emergency, all or some of the resource requirements may be required. To determine the resource requirements, the “State of Oklahoma Joint Center Operations Guide” will provide JIC logistics, job descriptions and training requirements for each function outlined in the guide.

Direction and Control

The Director of OEM is responsible for all education and informational programs conducted to exercise energy emergency responses. The Director of the OEM will appoint an OEM PIO to direct these activities. The heads of all State support agencies, boards, commissions, and volunteer organization agencies are responsible for appointing PIOs for their respective entities. These officers will be responsible for coordinated release with the OEM PIO.

MITIGATING, TRACKING, AND RESPONDING TO ENERGY EMERGENCIES

The following section outlines preventative and mitigating measures being taken in Oklahoma to ensure a stable energy supply. In particular, the section presents a number of response options that governmental officials might consider in the event of an energy emergency. In recognizing the importance of flexibility, this portion of the Plan should be treated like a “menu” of response options from which to select and implement, rather than a list of standard operating procedures. The list is divided into sector-specific response options. Within each sector, there are two types of response options. The first type of response is designed to manage the supply of energy. The second type of response is designed to manage the demand for energy. As with all emergencies, it is critical to treat every energy emergency as a unique circumstance. An effective response requires that officials tailor their actions to the incident at hand, rather than select a generic response that worked in the past. When deciding which response options should be employed, government officials and energy stakeholders must examine the severity, scope, and duration of the emergency as well as the resources available to officials.

Appendix D provides additional information about the procedures for implementing the menu of response options that appears below.

ELECTRICITY

A fundamental component of any energy assurance plan is how to prevent or mitigate damage to energy infrastructure systems. In the electric sector, the State oversees a variety of planning, inspection and maintenance programs at electric utilities, which, taken together, are designed to prevent outages or, when they do occur, to lessen the area covered and time needed for restoration of service. The State and electric utilities also have in place many mitigation techniques to reduce impacts of electric emergencies.

Preparation and Preventative Measures

In the electric sector, reliability is of foremost importance and under the authority of OAC 165:35-25-14, the OCC maintains information about each electric provider’s reliability plans. This section of the Oklahoma Administrative Code requires each utility to design and maintain a program to limit the frequency and duration of electric service interruptions. The program must include inspection, maintenance, repair and replacement standards that ensure service restoration as well as preventive and emergency maintenance. Each year, utilities report the results of their overall reliability program by submitting an annual reliability report to the OCC (OAC 165:35-25-20).

There are also proactive programs in place to try to prevent electric outages. As one means of prevention, Oklahoma electric providers and the Commission for years have worked together to develop rules and plans to try to minimize or eliminate trees from overhanging power lines, which would pose a threat during periods of high wind or ice accumulation. When power poles are toppled or lines are weighed down with ice, it can pull down utility poles on either side, creating a cascading effect. Through aggressive vegetation management program, contact between power lines and trees has been more limited in recent years. To accomplish this, the State's two largest electric utilities, PSO and OG&E, have been authorized funding for vegetation management, or tree trimming. Working with contractors, the companies have designed ongoing programs with regular schedules to trim trees so that it will take four years or longer for limbs to grow back into an area overhanging electric lines.

To lessen the potential for ice accumulation or damage from falling trees, many new housing additions constructed since the 1970s have featured buried electric cables. This reduces the number of outages by keeping the lines away from potential harm from weather. However, buried lines may be more susceptible to damage from things like flooding or excavation, in which case it can take longer to locate and repair a problem than when working on the more accessible overhead lines.

For some time, major electric transmission systems have been designed to minimize potential storm damage with towers designed to allow wind to pass through the structure. In 2008, the OCC began working with OG&E on a distribution system-hardening program so that should storm damage occur, the area affected will be minimized. The program emphasizes periodic reinforcement of poles within the distribution system to stop, or slow, the cascading effect and to significantly lessen the number of poles that are damaged, and, thus reduce restoration time and expense. In Oklahoma, however, tornadoes are more frequent than in many other states and, when they develop; they can pose a localized threat to any aboveground infrastructure.

In addition to the high-speed winds that sometimes accompany thunderstorms, lightning strikes can be a problem. In an effort to limit this damage, both OG&E and PSO operate OCC-authorized system hardening programs that include installing lightning arresters and strengthening poles at certain intervals so that if a pole is pulled or blown down, the weight does not create a domino effect and pull down neighboring poles. This combination program of vegetation management to reduce overhanging lines coupled with more undergrounding of power lines reduces exposure to weather and lessens the number of outages due to storm damage. To prevent accidental disruptions caused by excavation, the Oklahoma One Call System, known as CallOkie, requires businesses and private citizens to contact that system by phone or Internet before digging on their properties so that a representative of a utility or a locator service can come out and mark the path of buried lines to avoid damage to underground facilities.

Mitigation Measures and Restoration of Electric Power After Interruptions

When electrical outages do occur, utilities must take action to mitigate damage to the system and restore service as quickly as possible. There are several actions specific to Oklahoma that are helping utilities to shorten the duration of outages during or after emergencies.

First, by using forecasting techniques such as the Sperry-Piltz Ice Accumulation (“SPIA”) Index developed in Oklahoma⁶¹ (see Appendix E and www.spia-index.com), electric utilities can pre-position equipment at points expected to be the most impacted by weather events and, therefore, minimize the time for responding to outages. Based on experiences from past ice storms, the SPIA Index uses an ice accumulation algorithm and associated utility damage index to predict the location and severity of ice accumulations three to four days in advance and to classify potential electric utility system damage on a scale, enabling early warning of potential ice storm damage to electric utilities and emergency response entities. As of 2012, the National Weather Service has signed a license agreement to use the SPIA Index at local weather forecasting offices. Using the SPIA Index can help with:

- Advanced targeting of areas likely to receive heavy damage, with concentration of repair and reconstruction resources in zones with highest vulnerabilities.
- Pre-positioning of crews and advanced coordination with county commissioners, emergency managers and State emergency management officials, as well as with mutual aid entities, sheltering agencies, and contractors from across the State or multi-state region.
- Increased opportunity to coordinate materials and supplies purchases, deliveries and inventories.

Another initiative that has helped utilities limit outage time is the move toward more redundant transmission systems. Under this initiative, if a community loses power due to storm damage to transmission lines or generation outages, electricity can be delivered through another loop, so that the power stays on while repairs are underway.

Building on this program has been installation of smart meters during recent years. Oklahoma has been a leader in deployment of smart meter technology. OG&E was one of the first electric utilities in the country to obtain the authority to install smart meters and linking communication equipment across its entire service territory footprint. After conducting a smart meter pilot program encompassing all customers within the cities of Owasso, Sand Springs and Okmulgee, PSO also has sought Commission approval to install smart meter technology in its entire service territory. Smart meters give customers access to more information, and, hence, more control over their electric usage. They also allow the utility to automate some system functions, such as meter reading, service connects and disconnects, and also to assist in more rapidly locating

⁶¹ Sidney K. Sperry, Oklahoma Association of Electric Cooperatives and Steve Piltz, Chief Meteorologist for the National Weather Service in Tulsa, designed the SPIA Index.

outages and starting repairs. When fully implemented, smart meter technology will lead to a “self-healing” grid capable of isolating problem areas and automatically rerouting power around that location so as to avoid service interruption.

The OCC requires utilities, to the extent possible, to plan for outage situations, and under OCC rule OAC 165:35-19-4, each electric utility must annually submit an updated Restoration of Service Plan to the Commission. After an outage, the utility must communicate its progress in restoring service and must use the following guidelines when developing and implementing its plan:

(1) Assessment of the extent of the service interruption and what resources (equipment, materials, and labor) will be required to restore service. The utility should also attempt to determine the number of customers affected and the geographic extent of the service interruption.

(2) Determination as to whether the service restoration can be accomplished through the use of in-house personnel only, or if contractors (personnel obtained from other utilities or third-party entities) will be required. The objective is to have service restored as soon as possible.

(3) Identification of priorities for service restoration, based upon emergency needs and ease of restoration based on the most efficient use of money, time, and effort. Priority shall be given to eliminating any life-threatening situations known or discovered during restoration of service.

(4) Once electricity/gas service has been restored to public health and safety institutions, such as hospitals, fire and police departments and 911 centers, service next shall be restored to schools as quickly as feasible, during such times of the year when schools are in session.

(5) Attempted notification of high-priority customers or major electric/gas-consuming facilities that are affected by the service outage. Radio and/or television should be utilized to notify larger numbers of customers as to the type and extent of the service outage and the expected time to restore service. Other means of notification may also be utilized, so long as the result is mass notification on an efficient, effective, and timely basis.

(6) Commission notification through the Director of the OCC Public Utility Division’s Consumer Services department to implement the process outlined in paragraphs A through C below. The Commission notification process to the designated Consumer Services department Staff individual(s) may be accomplished by business telephone and/or e-mail during OCC business hours from 8:00 a.m. through 4:30 p.m., Monday

through Friday, or by emergency cellular telephone number after normal business hours or during weekends or holidays. The notification shall consist of the following:

(A) An initial contact to notify Staff of outages which involve a major utility substation or facility, or which may cause a high degree of public interest or concern, or which have a duration of four or more hours and involve at least 1% or fifty (50) of the utility's metered customers, whichever is greater.

(B) Intermediate contact to provide status reports, as deemed necessary by the utility, or as may be requested by Commission Staff.

(C) A conclusory contact responsible for detailing the results and completion of the plan for restoration of service.

In addition, OCC rules at OAC 165:35-33-7(f) require electric utilities to develop and maintain an updated Homeland Security and Critical Infrastructure Plan, which designates physical assets and computer software that the utility considers to be critical infrastructure and outlines the utility's measures to protect those facilities from extended service interruptions. Each electric utility keeps its plan in a confidential location, but is required to notify the Corporation Commission each year that the utility's plan is updated. By understanding the precise location of critical infrastructure and planning to keep these facilities secure, utilities can minimize the risk of impacts on customers.

Lastly, to minimize the time of disruptions, electric utilities can also request assistance in restoring power from organizations in which they hold membership. For example, OG&E is a member of the Southeast Electric Exchange, which dispatches mutual assistance teams in cases of widespread outages. PSO is part of the EEI Mutual Assistance Program, the Southeast Electric Exchange mutual assistance group, the Midwest Mutual Assistance group, the Texas Mutual Assistance group, and the Great Lakes Mutual Assistance group. Electric cooperatives also have a mutual assistance program for sharing repair crews. The OAEC coordinates mutual aid responses for all of its members using a standardized agreement in place across the membership. The OAEC works with FEMA and also obtains information from affected members about how much assistance and equipment is needed and coordinates logistics. It is important to note that because electric voltages, power line design and circuitry can vary among between cooperative, investor-owned, and municipal electric providers, safety issues can arise in providing mutual aid across provider types. Therefore, mutual aid across provider types would be limited to logistical or transportation assistance rather than technical aid.

At the federal level, emergency response agencies are also working to minimize the duration of electric outages. For instance, FEMA has formed the Power Restoration Task Force to minimize bureaucracy and help utilities with restoration efforts. This assistance may include lending utilities heavy-duty water pumps and generators and arranging military flights to deliver equipment such as transformers and trucks.

Nationally, researchers are also working on a variety of equipment improvements to reduce the expense and time for service restoration should an outage occur, and Oklahoma utilities monitor these new technologies for potential adoption.

When an outage does occur, even as utilities work to limit the duration of the outage, it is critical that responders have a variety of options available to them to manage supply and demand for electricity while the interruption is occurring. Therefore, the list below outlines a variety of specific options from which energy emergency responders may choose when responding to electric outages. Additional details regarding each option can be found in Appendix D.

Managing Supply

- Participate in regional planning and transmission organizations, for Oklahoma, the Southwest Power Pool⁶²
- Temporarily increase levels of coal stockpiled by electric utilities
- Temporarily substitute Oklahoma coal for Wyoming coal in coal-fired power plants
- Reduce voltage in the system
- Use large backup generation when mobile units are available
- Use locomotive generators for electricity generation in selected locations

Managing Demand

- Activate interruptible rates/curtailment programs
- Implement rolling blackouts across a utility system
- Enact voluntary or mandatory curtailment of public building energy use
- Employ and/or expand time-of-use rates for residential and/or industrial users
- Use the cogeneration or fuel switching capacity of university and industrial customers when available
- Conduct a public information program that promotes home energy assessments
- Conduct a public information program or enact an incentive program to purchase more efficient appliances and lighting and add insulation
- Conduct a public information campaign calling for electricity conservation
- Increase rates to customers of self-regulated cooperatives or municipal utilities
- Encourage or direct government facilities to improve energy efficiency

⁶² Oklahoma is one of 14 states located within the footprint of the Southwest Power Pool (SPP), a Regional Transmission Organization (RTO). RTOs were formed to maintain electric reliability and coordination to ensure reliable supplies of power, adequate transmission infrastructure, and competitive wholesale prices of electricity. The major services of SPP are Facilitation of the Transmission Grid, Reliability Coordination, Transmission Service/Tariff Administration, Market Operation, Setting of Standards, Compliance Enforcement, Transmission Planning and Training. As a part of compliance, the SPP has a Regional Entity (RE) that enforces compliance with federal and regional reliability standards for users, owners, and operators of the region's bulk power grid.

- Encourage or direct regulated utility providers to increase and/or provide additional programs to their customers which focus on energy efficiency
- Utilize buy-back rates that pay customers to sell excess self-generated electricity back to the grid for utility credit
- Encourage the use of alternative fuels, such as natural gas, propane, diesel or wood, as the fuel source for home heating

CRUDE OIL AND PETROLEUM PRODUCTS

Preparation and Preventative Measures

Just as in the electric sector, the State of Oklahoma and the oil and petroleum industry have preventive programs in place to avoid oil and petroleum-related accidents or incidents and ensure a safe and reliable supply for consumers. In this industry, the OCC has inspection and regulatory responsibilities for exploration and production activities on the oil and gas lease site to ensure protection of public health and safety and the environment, for safe transport of hazardous materials, and for safe storage of petroleum-based fuel.

Both federal and State agencies regulate the petroleum industry. At the federal level, much of the regulation occurs through the U.S. EPA. At the state level, both the OCC and the DEQ provide regulatory oversight.

The OCC's Oil and Gas Conservation Division, with its headquarters and functions based in Oklahoma City and additional administrative and judicial activities in Tulsa, regulates crude oil and gas drilling and production and disposal of produced waters and drilling fluids, and through its staff from four regional offices (in Ada, Bristow, Duncan and Kingfisher) conducts on-site inspections of wells and other oilfield activities and enforces Commission rules that govern Oklahoma oilfield practice, to protect the rights of oil and gas operators and mineral owners, the environment and the public. Each district office has a manager and several field inspectors. Pursuant to 17 O.S. § 52, except as otherwise provided in that statute, the Corporation Commission in Oklahoma is "vested with exclusive jurisdiction, power and authority with reference to a.) the conservation of oil and gas; b.) field operations for geologic and geophysical exploration for oil, gas and brine, including seismic survey wells, stratigraphic test wells and core test wells; c.) the exploration, drilling, development, producing or processing for oil and gas on the lease site; and d.) the exploration, drilling, development, production and operation of wells used in connection with the recovery, injection or disposal of mineral brines." The Commission draws additional Oklahoma oil and gas regulatory authority from various other statutes, including 52 O.S. § 139, and also regulates Oklahoma's oil and gas drilling and production industry and well sites through its rules found in OAC 165:10. In addition to conducting field inspections, the Commission's oil and gas field inspectors coordinate with county emergency managers for the protection of the environment and public in the event of an oilfield emergency, such as a well blowout or an unauthorized release of saltwater from an oil and gas lease.

The Commission's Pipeline Safety Department inspects and regulates all intrastate petroleum transmission and distribution pipelines, whether gas or liquid. The Pipeline Safety Office of the U.S. DOT regulates interstate lines. These inspection and maintenance programs work to try to provide for the safe operation of the pipeline facilities and significantly lessen the likelihood of a fuel supply interruption to the generating plants.

The Oklahoma DEQ has responsibilities for safe practices at oil refinery sites, primarily from an air and water quality standpoint. The ODEQ offers a 24-Hour Emergency Response and Environmental Complaints Hotline that both State officials and the general public can use. That number is 1-800-522-0206.

The OCC's Petroleum Storage Tank Division ("PSTD") also enforces State and federal regulations pertaining to thousands of underground and aboveground petroleum storage tanks across Oklahoma that contain gasoline, diesel and aviation fuel as well as kerosene, motor oil and antifreeze.

Chapters 25, 26 and 29 of the OCC rules (OAC 165:25, 26, 29) detail the Commission's authority in ensuring safe storage of these products. These rules are based on industry standards including those from the Petroleum Equipment Institute, American Petroleum Institute, and National Fire Protection Association. These rules require station owners/operators to perform tightness tests on their tanks and lines and keep records of test results and on volumes of products pumped into and out of these tanks so the operator can detect if any unaccounted for losses of product might indicate a tank leak. To check on compliance, the Commission's PSTD employs a staff of fuel inspectors who annually check testing records at refilling stations and also test the corrosion protection system on the fuel storage tanks. Inspectors have the authority to lock down tanks in the event of a suspected leak or if the operator fails to maintain proper records and to request an investigation if noncompliance is discovered. Station operators must report any release or any spill of over 25 gallons within 24 hours to the OCC PSTD. Both the PSTD and the environmental compliance experts at the Commission have 24-hour emergency numbers that are provided to station operators. To assist in remediating any spills, new stations must file blueprints of underground tanks and lines with the OCC PSTD. The Division's fuel inspectors also monitor calibration of gasoline pumps at public filling stations to check whether consumers are receiving the accurate amount of fuel at each purchase. These inspectors also check octane levels in fuel and assist tank owners with proper release detection methods. The Division also administers the Petroleum Storage Tank Release Indemnity Fund, created by the State Legislature in 1989 to help fuel storage tank owners meet requirements to have liability insurance coverage for damage that may result from tank leaks.

Mitigation Measures after Supply Interruptions

In the event of a spill, explosion, or other well site emergency, OCC field inspectors serve as first responders. Well owners are required to report to the OCC within 48 hours on any site incident that includes a spill of over 10 barrels or a blowout, and must report any explosions or fires immediately. Chapter 10 rules require well owners to report these incidents to the relevant OCC district office, which then coordinates with the OCC Public Information Officer. In addition, an OCC Oil and Gas Conservation Division manager carries a division emergency phone at all times for notification of incidents. Finally, if a reportable incident does occur, well owners must submit a remediation plan to the OCC. If an abandoned well is determined to be leaking oil, gas or saltwater, the OCC can order the well plugged by using a State fund capitalized by oil and gas well operators. In emergency situations, the OCC can use a Governor's letter and an emergency evidentiary hearing before the Commission so that the well can be plugged expeditiously.

At the federal level, the U.S. EPA is also involved in regulating certain aspects of industry in Oklahoma, including the energy industry. The Superfund Amendments and Reauthorization Act (SARA) Title III, which is enforced by the EPA and also known as the Emergency Planning and Community Right-to-Know Act, requires operators to notify local first responders of the inventory of any hazardous and toxic chemicals stored on-site at a location, so those responders will be able to take adequate precautions and respond effectively to mitigate damage in the event of an emergency. The EPA also requires any aboveground oil or refined product storage facility to provide a Spill Prevention, Control, and Countermeasure Plan ("SPCC").

If an incident occurs at a petroleum storage site or filling station, station operators must report any release or any spill of over 25 gallons within 24 hours to the OCC PSTD. The PSTD and the environmental compliance experts at the Commission provide tank operators with 24-hour emergency numbers.

When an outage occurs, even as the industry works to limit the supply disruption, it is critical that State authorities establish controls on supply and demand for petroleum and gasoline such as mandatory gasoline rationing, so that first responders have the ability to address effectively the outage. Therefore, as mentioned above, the list below outlines a variety of specific options energy emergency responders may choose to take when responding to petroleum or gasoline supply disruptions. Appendix D shows additional details regarding each of these options.

Managing Supply

- State of Oklahoma assumes control of fuel prioritization
- Temporarily lift Federal Motor Carrier Safety Regulations for trucks
- Top off fuel storage tanks in anticipation of an event that will impact gasoline transportation
- Encourage or require longer refill cycles for tanks, or wait until tank is completely depleted before the tank is refilled

- Request waivers from the U.S. EPA for the import of gasoline that does not meet local air quality requirements
- Request waivers from EPA to allow for high sulfur diesel products
- Petition the EPA to allow refineries to sell gasoline out of season or to suspend the Reid Vapor Pressure Standard (RVP) for gasoline
- Petition the U.S. DOE or President for an exchange or release of crude oil from the U.S. Strategic Petroleum Reserve

Managing Demand

- Conduct a public information campaign designed to encourage ridesharing.
- Conduct a public information campaign designed to encourage fuel-efficient driving practices
- Trigger the Oklahoma Emergency Price Stabilization Act to prevent price gouging
- Offer discounted rates or incentives for using any public transit options
- Increase the number or frequency of bus routes
- Reduce speed limits on roadways, and/or increase the enforcement of either lowered or existing speed limits
- Conduct a public information campaign encouraging private sector telecommuting or teleworking
- Enact or support a telework or telecommuting policy for public employees
- Encourage staggered commute times for public and/or private employers and/or staggered school start times
- Curtail use of marine and off-road recreational vehicles
- Encourage the use of alternative fuels such as CNG, biofuels, or diesel

NATURAL GAS

Preparation and Preventative Measures

The natural gas industry in Oklahoma is also regulated by the State. The Pipeline Safety Department within the OCC Transportation Division is responsible for enforcing *intrastate* natural gas and hazardous pipeline operators' compliance with State and federal pipeline safety regulations. Federal requirements mandate that pipeline operators determine the integrity of their pipelines through testing for appropriate pressure and for physical weakness or threats and keep logs of this testing. Pipeline Safety's field Staff inspects the records and monitors operations of pipeline operators statewide, as well as performs site inspections. It is important to note that, except for the requirement that their operators report major incidents, gas gathering lines, the lines collecting gas from individual wells in an area and connecting that gas to a larger gas transmission line, when considered a Class 1 pipeline, which is located normally in a rural

area, are also not subject to state regulation.⁶³ Interstate pipeline operators are subject only to safety regulations enforced by the U.S. DOT's PHMSA, but the PHMSA is in regular contact with the OCC to inform staff of any interstate incidents or accidents.

In addition, in 2002 the federal Pipeline Safety Improvement Act required the U.S. Secretary of Transportation to issue regulations defining pipeline integrity management programs, prescribing the standards for conducting risk analyses, and adopting and implementing integrity management programs for natural gas pipelines. Subsequently, the PHMSA issued a rule requiring natural gas pipeline operators to develop integrity management programs for gas transmission pipelines in high-consequence areas. This rule has prompted Oklahoma Natural to undertake a complete inspection and, where needed, upgrade its transmission lines in segments over a multi-year period, including defining "high-consequence" areas of pipeline and developing a baseline assessment plan to consistently assess the integrity of pipeline segments and prioritize risks. The Corporation Commission authorized Oklahoma Natural to fund this program through implementation of an Integrity Management rider for several years, until the June 2011 when the rider. However, Oklahoma Natural continues its effort to maintain pipeline integrity. Also, Oklahoma Natural received authorization and funding approval to take over inspection of customer yard lines on a five-year cycle, thus inspecting one-fifth of the yard line distribution system each year, which began in January 2001.

The State's other major natural gas utility, CenterPoint Oklahoma, is a distribution-only company and receives its transmission service from an interstate system that is under the regulatory authority of the U.S. DOT and the Federal Energy Regulatory Commission. CenterPoint Oklahoma remains responsible for the maintenance of its distribution system. In addition to the OCC's Public Utility Division, regulation of this distribution system also falls under the purview of the Commission's Pipeline Safety Department.

Finally, and similarly to the electric sector, to prevent accidental disruptions, the Oklahoma One Call System, known as CallOkie, requires companies and private citizens to contact it by phone or email before digging on their property so that utilities or a buried utility line locator service can come out and mark the path of underground lines to avoid damage.

Mitigation Measures After Supply Interruptions

All pipeline operators subject to federal regulation 49 CFR Parts 192 (natural gas) and 195 (liquids) have reporting requirements, and must report incidents or accidents of a certain magnitude both to the PHMSA and OCC's Pipeline Safety Department.⁶⁴ Reports of code

⁶³ 49 CFR § 192.5(1)(ii) A Class 1 location is any class location unit that has 10 or fewer buildings intended for human occupancy.

⁶⁴ Both the federal PHMSA and the State of Oklahoma outline in detail what magnitude of leak or incident requires reporting. For natural gas, the federal standard for intrastate operators is \$50,000 in economic loss, a loss of life,

violations go to the pipeline operator for correction. If the violation is serious or the operator repeatedly violates regulations, the Pipeline Safety Department will recommend an enforcement action. In the case of an accident with environmental consequences, the OCC and the DEQ have a Memorandum of Understanding regarding oversight of cleanup of crude oil or other liquids from oil and gas industry activity. Federal requirements also apply through standards issued by the U.S. EPA.

In the case of a supply interruption or shortage, regulated natural gas companies will inform the OCC under the following circumstances:

- The outage involves a major regulator station or facility
- The outage may involve a high degree of public interest or concern
- The outage will have a duration of four hours or more and involve at least 1% of the utility's customer meter count or 50 customers, whichever is greater.

As the collection point for reports of pipeline emergencies, the Pipeline Safety Department maintains an on-call employee who is available to be contacted 24 hours a day, seven days a week, in the event of an emergency situation. Pipeline Safety Department personnel are not first responders but play an important role as evaluators of information. The Department may call operators to substantiate information or send inspectors to commence an investigation. Operators are required to conduct failure investigations and the Pipeline Safety Department audits operators to make sure such investigations are carried out.

Just as in the electric sector, regulated natural gas utilities are required by the OCC to plan for supply interruptions and, under Commission rule OAC 165:45-9-2), each year must submit an updated Restoration of Service Plan to the Commission. After an outage, the utility must communicate its progress in restoring service and must use the following guidelines when developing and implementing its Restoration of Service Plan:

- (1) Assess the extent of the service interruption and determine what resources (equipment, materials, and labor) will be required to restore service. The utility should also attempt to determine the number of customers affected and the geographic extent of the service interruption.
- (2) Determine whether the service restoration can be accomplished using in-house personnel only, or if contractors (personnel obtained from other utilities or third-party entities) will be required. The objective is to have service restored as soon as possible.

worker injury, or a lost of 3 million cu. ft. of gas. The State standard for natural gas is any economic loss over \$5,000.

(3) Identify priorities for service restoration, based upon emergency needs and upon ease of restoration for the most efficient use of money, time, and effort. Give priority to any life-threatening situations known or discovered during restoration of service.

The following excerpt from CenterPoint Oklahoma's restoration of service plan is representative of restoration of service plans across the natural gas sector:

The Company has identified a primary and secondary emergency contact and has provided full contact information for these individuals to the OCC's Public Information Officer as part of its Restoration of Service Plan. An outline of the CenterPoint Oklahoma's Emergency Operations Plan as it relates to restoration of service is as follows:

1. Determine the geographic area of the outage.
2. Determine the cause and time needed to restore gas service to the impacted area.
3. Determine how many meters are involved and the workers required for turn-off and turn-on operation.
4. Notify upper management and civil authorities if necessary.
5. Request the needed number of completely equipped service persons for the turn-off operation.
6. Print scrolls, route cards, address lists and/or maps.
7. Isolate the affected area by turning off valves, regulator stations, or other pressure control devices.
8. Identify those responsible for conducting field operations.
9. Implement turn-off procedures (without blind plates).
10. Request supplemental completely equipped service persons for the turn-on operation.
 - a. Restore service to system.
 - b. Purge system at identified purge points.
 - c. Turn on customers, identify and give special attention to priority customers, and tag door of any customers that cannot be turned on at the time.

The Company mandates that its local business units maintain:

1. List of telephone numbers for: local emergency response personnel, company management personnel, civil authorities associated with the local service area, gas pipeline suppliers delivering gas to the local service area, other utility companies within the local service area, and contractors qualified to perform gas line work in the near vicinity.
2. List of emergency equipment, tools and materials available at the location.
3. List of key valves and/or maps.

The Company recommends that its business units maintain:

1. List of curtailment customers.
2. List of customers with high priority for restoration.

When an event does occur, even as the industry works to limit the time of disruption, it is critical that responders have a variety of options available to them to manage supply and demand for natural gas while the interruption is occurring. Therefore, the list below outlines a variety of specific options energy emergency responders may choose to take when responding to natural gas shortages. Appendix D shows additional details regarding each of these options.

Managing Supply

- Temporarily lift wellhead restrictions on the production of natural gas to allow companies to pump as much as possible.
- Allow pipeline pack to increase reserve supplies available.
- Local gas distribution companies can purchase additional gas to meet demand.
- Gas companies that are drawing gas from storage facilities can increase the rate of withdrawal to meet short-term increased demand.
- Encourage or require gas companies, when technically feasible, to access and use other sources of gas, such as LNG, propane air stations, and/or synthetic natural gas.

Reducing Demand

- Encourage or require a temporary reduction in natural gas usage in State facilities or by industrial users.
- Request that large commercial and industrial customers reduce gas use by decreasing their thermostat settings or reducing gas-consuming industrial processes.
- Encourage residential customers to lower thermostats and water heating settings, reduce hot water demand, and defer using gas appliances.
- Curtail or shut off gas supply to customers, regardless of interruptible agreements in place.
- Increase retail rates to consumers.
- Conduct a public information campaign and/or offer incentives that provide information, energy estimates, or discounts for the purchase and installation of more efficient natural gas appliances.
- Encourage large industrial customers to participate in a gas buy-back program.

CONCLUSION

Oklahoma's energy landscape is one of a kind. In conjunction with the State's main emergency planning document, the Oklahoma Emergency Operations Plan, this Energy Assurance Plan represents a detailed picture of the energy industries of our State, outlines the history and potential for likely causes of energy emergencies, and presents policy and strategy options for decision makers to use when mitigating and responding to energy emergencies. It is intended as an additional "tool in the toolbox" for government and private sector partners to use in a way that will minimize the impact of future energy emergencies.

The importance of fostering ongoing dialogue regarding energy assurance cannot be overstated. Therefore, it is Oklahoma's intent to revisit regularly the content of this Plan to ensure its accuracy, and to continue the conversation with government partners, energy providers, and other stakeholders to ensure that this EAP continues to provide information and direction to energy planners and responders for many years into the future.

At any time, direct questions and comments regarding the Oklahoma Energy Assurance Plan to the Oklahoma State Energy Office, part of the Office of the Oklahoma Secretary of Energy & Environment, by contacting Kylah McNabb at (405) 522-7226 or Kylah.McNabb@ee.ok.gov.

Appendix A: Supply Disruption Tracking

Oklahoma has developed a multi-faceted tracking process to gather and analyze energy information on a daily, weekly, monthly and annual basis, giving energy assurance planners additional tools to monitor energy supplies in the electric, natural gas, and petroleum sectors.

Electric Sector Supply Tracking

The OCC requires regulated utilities to perform detailed tracking of outage information—this is a part of determining the System Average Interruption Frequency Index (“SAIFI”) and the System Average Interruption Duration Index (“SAIDI”). Utilities provide aggregated information annually to the OCC Public Utility Division and such information summarized in an annual Reliability Scorecard report. In addition, some Oklahoma utilities offer web-based outage information that can be utilized by the public. That public tracking information can be found at:

Oklahoma Gas & Electric Company

<https://www.oge.com/wps/portal/oge/outages/systemwatch/>

Public Service Company of Oklahoma

<https://www.psoklahoma.com/outages/>

Empire District Electric Company

<https://www.empiredistrict.com/Outages/OutageMap.aspx>

In outage situations, as described in the Mitigating, Tracking, and Responding to Energy Emergencies section of this Plan, utilities remain in regular communication with the Corporation Commission to provide status updates regarding outages and restoration times.

To give energy assurance planners additional tools to better understand trends in electric supply and outages, the Public Utility Division at the Corporation Commission also maintains regularly-updated spreadsheets containing myriad information regarding energy supplies, prices and outages. The following data is collected and reviewed on a regular basis:

- Average Retail Price of Electricity to Customers by Sector (monthly)
- Net Generation by Sector (monthly)
- Retail Sales of Electricity to Customers by Sector (monthly)
- Incident tracking by date, duration, area, event type, demand loss and customers affected (monthly)

The Energy Information Administration and the U.S. DOE is the source of the data compiled.

Natural Gas Sector Supply Tracking

Within the natural gas sector, the Public Utility Division of the Corporation Commission does weekly and monthly tracking of both pricing and incident reports. The following data is collected and reviewed on a regular basis:

- Henry Hub Spot Price (weekly)
- Citygate Price (monthly)
- Residential Price (monthly)
- Commercial Price (monthly)
- Industrial Price (monthly)
- Electric Power Price (monthly)
- Incident tracking by date, location, release amount, casualties, shutdown duration, cause, and cost (monthly)

The Energy Information Administration and the U.S. DOT's PHMSA is the source of the data compiled.

Petroleum Sector Supply Tracking

Within the petroleum sector, the Public Utility Division of the Corporation Commission does daily, weekly and monthly tracking of pricing. The following data is collected and reviewed on a regular basis:

- Crude Oil Spot Price, Cushing, Oklahoma (daily)
- Spot Fuel Prices, by fuel type (daily)
- National, Regional and Statewide Retail Prices, by fuel type (weekly)
- Inventories, by fuel type (weekly)
- Prime Supplier Sales in Oklahoma, by fuel type (monthly)

The Energy Information Administration and the American Automobile Association is the source of the data compiled.

Appendix B: Cooperatives Serving Oklahoma

Oklahoma statute 17 O.S. § 158.27 allows electric cooperatives to opt out of price regulation and be self-governing with an elected board of directors accountable to their customers. Most of the cooperatives in the State have opted for the self-regulatory option. While the OCC does not directly regulate these cooperatives in terms of rates, the OCC is responsible for monitoring the status and reliability of each provider and, for those cooperatives that have not opted out of price regulation, for monitoring the accuracy and prudence of purchased power costs passed on to their Oklahoma customers through the Purchased Power Adjustment Clause.

Those that have not opted out of price regulation and whose service reliability and pricing is regulated by the OCC are:

- Arkansas Valley Cooperative
- Canadian Valley Electric Cooperative *
- Northeast Oklahoma Electric Cooperative**
- Rich Mountain Electric Cooperative
- Southwest Arkansas Electric Cooperative

The cooperatives that have opted out of price regulation by the OCC but that are still under the Commission's regulation for service reliability are:

- | | |
|--|---|
| • Alfalfa Electric Cooperative* | • Lake Region Electric Cooperative** |
| • Caddo Electric Cooperative* | • Northfork Electric Cooperative* |
| • Central Rural Electric Cooperative** | • Northwestern Electric Cooperative* |
| • Choctaw Electric Cooperative* | • Oklahoma Electric Cooperative** |
| • Cimarron Electric Cooperative* | • Ozarks Electric Cooperative** |
| • Cookson Hills Electric Cooperative** | • People's Electric Cooperative* |
| • Cotton Electric Cooperative* | • Red River Valley Rural Electric Association* |
| • East Central Electric Cooperative*** | • Rural Electric Cooperative, Inc.* |
| • Harmon Electric Association* | • Southeastern Electric Cooperative, Inc.* |
| • Indian Electric Cooperative** | • Southwest Rural Electric Association, Inc.* |
| • Kay Electric Cooperative* | • Tri-County Electric Cooperative, Inc.**** |
| • Kiamichi Electric Cooperative*** | • Verdigris Valley Electric Cooperative, Inc.** |
| • Kiwash Electric Cooperative* | |

*Denotes membership in the Western Farmers Electric Cooperative (WFEC)

**Denotes membership in KAMO Electric Cooperative, Inc. (KAMO Power)

***Denotes membership in both WFEC and KAMO Power

****Denotes membership in Golden Spread Electric Cooperative

Appendix C: Public Compressed Natural Gas Fueling Station Locations

Station Name	Street Address	City	Access Type	Fill Type Code	PSI	Access Time	Cards Accepted	Station Phone
Ada Travel Stop West	201 Latta Rd	Ada	Public	Q	3000 3600	24 hours daily	Cash Checks M V Voyager Wright_Exp	580-310-0900
Love's Travel Stop #8	619 N Main St	Altus	Public	Q	3600	24 hours daily	Cash Checks A D M V FuelMan Voyager Wright_Exp EFS FleetOne Tchek TCH	580-482-6167
OnCue Express #356	2860 College Blvd	Alva	Public - Credit card at all times	Q	3600	24 hours daily	M V FuelMan Voyager Wright_Exp	405-338-8552
Oklahoma Natural Gas - Anadarko Service Center	1700 E Central	Anadarko	Public - Credit card at all times	B	3000	24 hours daily	D M V FuelMan Voyager Wright_Exp	844-713-7987
Oklahoma Natural Gas - Southern Oklahoma Development Association	1995 Veterans Blvd	Ardmore	Public - Credit card at all times	Q	3000 3600	24 hours daily	D M V FuelMan Voyager Wright_Exp	844-713-7987
Love's Travel Stop #266	3201 12th Ave NW	Ardmore	Public	Q	3600	24 hours daily	Cash Checks A D M V FuelMan Voyager Wright_Exp EFS FleetOne Tchek TCH	580-226-0973

Station Name	Street Address	City	Access Type	Fill Type Code	PSI	Access Time	Cards Accepted	Station Phone
Arkansas Oklahoma Gas Corp	4419 Main St	Arkoma	Public - Credit card at all times	Q	3600	24 hours daily	M V FuelMan Wright_Exp Comdata	405-338-8552
Oklahoma Natural Gas - Bartlesville Service Center	3601 NE Indiana St	Bartlesville	Public - Credit card at all times	B	3000 3600	24 hours daily	D M V FuelMan Voyager Wright_Exp	844-713-7987
OnCue Express #45	7850 Acre Rd	Billings	Public - Credit card at all times	Q	3600	24 hours daily	A D M V FuelMan Voyager Wright_Exp	580-725-3252
Oklahoma Natural Gas - Broken Arrow Service Center	2421 S 1st Pl	Broken Arrow	Public - Credit card at all times	Q	3000 3600	24 hours daily	D M V FuelMan Voyager Wright_Exp	844-713-7987
Jiffy Trip	1745 S Grand Ave	Cherokee	Public	Q	3600	24 hours daily	Cash Checks A D M V FuelMan Voyager Wright_Exp Comdata FleetOne	580-596-2340
Love's Travel Stop #86	1326 S 4th St	Chickasha	Public	Q	3600	24 hours daily	Cash Checks A D M V FuelMan Voyager Wright_Exp EFS FleetOne Tchek TCH	405-222-2355
Love's Travel Stop #486	7401 S Choctaw Rd	Choctaw	Public	Q	3600	24 hours daily	Cash Checks A D M V FuelMan Voyager Wright_Exp EFS FleetOne Tchek TCH	405-391-3855

Station Name	Street Address	City	Access Type	Fill Type Code	PSI	Access Time	Cards Accepted	Station Phone
Oklahoma Natural Gas - Claremore Service Center	1449 SW Country Club Rd	Claremore	Public - Credit card at all times	B	3000 3600	24 hours daily	D M V FuelMan Voyager Wright_Exp	844-713-7987
Oklahoma Natural Gas - Clinton Service Center	500 W Commerce	Clinton	Public - Credit card at all times	B	3000	24 hours daily	D M V FuelMan Voyager Wright_Exp	844-713-7987
Domino Express #1	1709 S Highway 183	Clinton	Public - Credit card at all times	Q	3600	24 hours daily	A D M V FuelMan Voyager Wright_Exp Comdata EFS	580-323-2929
Oklahoma Natural Gas - CNG Maintenance Facility	1028 N Preston	Davenport	Public - Credit card at all times	Q	3000	24 hours daily	D M V FuelMan Voyager Wright_Exp	844-713-7987
OnCue Express #107	5500 SE 29th St	Del City	Public - Credit card at all times	Q	3600	24 hours daily	M V FuelMan Voyager Wright_Exp	405-672-3420
America's Fuel 4 U	7301 N Highway 81	Duncan	Public - Credit card at all times	Q	3600	24 hours daily	A D M V FuelMan GasCard Voyager Wright_Exp	580-255-3111
OnCue Express #115	3201 S Kelly Ave	Edmond	Public	Q	3600	24 hours daily	Cash A D M V FuelMan Voyager Wright_Exp	405-359-1141
OnCue Express #105 - C-Store	800 S Broadway	Edmond	Public	Q	3600	24 hours daily	Cash M V FuelMan Voyager Wright_Exp	405-330-6009
OnCue Express #120	TBD	Edmond	PLANNED - not yet accessible (Public)	Q	3600	24 hours daily	Cash M V FuelMan Voyager Wright_Exp	
Total Express	16401 N Rockwell Ave	Edmond	Public - Credit card after hours	Q	3600	5:30am-10:30pm M-Sat 7am-10pm Sun	Checks Cash M V	405-348-3835

Station Name	Street Address	City	Access Type	Fill Type Code	PSI	Access Time	Cards Accepted	Station Phone
OnCue Express #351	3401 S Radio Rd	El Reno	Public - Credit card at all times	Q	3600	24 hours daily; station can accommodate heavy-duty vehicles in need of emergency fueling	M V FuelMan Voyager Wright_Exp	405-338-8552
Domino Express #9	1303 W 3rd St	Elk City	Public	Q	3600	24 hours daily	Cash Checks A D M V FuelMan Voyager Wright_Exp	580-225-0152
Hutch's C-Store #119	2001 E 7th St	Elk City	Public - Credit card at all times	Q	3600	24 hours daily	A D M V Voyager Wright_Exp	580-303-4515
Hutch's C-Store #801	515 S Main St	Elk City	Public - Credit card at all times	Q	3600	24 hours daily	A D M V Voyager Wright_Exp	580-225-0301
Oklahoma Natural Gas - Enid Service Center	421 S Garland Rd	Enid	Public - Credit card at all times	B	3000 3600	24 hours daily	D M V FuelMan Voyager Wright_Exp	844-713-7987
OnCue Express #326 - C-Store	1005 E Owen K Garriot	Enid	Public	Q	3600	24 hours daily	Cash M V FuelMan Voyager Wright_Exp	580-237-4898
L&S Fuels LLC	120 Cedar Springs Rd	Fairview	Public - Credit card at all times	Q	3600	24 hours daily	D M V FuelMan Voyager Wright_Exp	580-227-0999
Tillman's Producers Co-op Fueling Station	507 S Main St	Frederick	Public - Credit card at all times	Q	3000	24 hours daily	D M V FuelMan Voyager Wright_Exp	580-335-2107
B&H Construction	600 W Interstate Dr	Goldsby	Public - Credit card at all times	Q	3600	24 hours daily	A D M V Wright_Exp	405-288-2412
Blue Energy Fuels	573 W 3rd St	Grove	Public - Credit card at all times	Q	3600	24 hours daily	D M V FuelMan Voyager Wright_Exp	918-641-2583

Station Name	Street Address	City	Access Type	Fill Type Code	PSI	Access Time	Cards Accepted	Station Phone
Oklahoma Natural Gas - Guthrie Service Center	205 Sigma Pl	Guthrie	Public - Credit card at all times	B	3000	24 hours daily	D M V FuelMan Voyager Wright_Exp	844-713-7987
Love's Travel Stop #604	2700 E Highway 33	Guthrie	Public	Q	3600	24 hours daily	Cash Checks A D M V FuelMan GasCard Voyager Wright_Exp	405-260-1493
High Plains Bioenergy	3271 US Highway 54	Guymon	Public - Credit card at all times	Q	3600	24 hours daily	D M V Voyager Wright_Exp	580-468-3790
Champion CNG	316 N Main St	Hennessey	Public - Credit card at all times	Q	3600	24 hours daily	A D FuelMan M V Voyager Wright_Exp	405-853-5111
OnCue Express #358	1206 S Main St	Hennessey	Public - Credit card at all times	Q	3600	24 hours daily	M V FuelMan Voyager Wright_Exp	405-338-8552
Love's Country Store #5	203 S Main	Kingfisher	Public	Q	3600	24 hours daily	Cash Checks A D M V FuelMan Voyager Wright_Exp EFS FleetOne Tchek TCH	405-375-5019
Love's Travel Stop #263	24169 Highway 49	Lawton	Public	Q	3600	24 hours daily	Cash Checks A D M V FuelMan Voyager Wright_Exp EFS FleetOne Tchek TCH	580-529-2882
OnCue Express #352	1407 SE 4th St	Lindsay	Public - Credit card at all times	Q	3600	24 hours daily	M V FuelMan Voyager Wright_Exp	405-338-8552
City of Mannford	210 E Trower Blvd	Mannford	Public - Credit card at all times	Q	3600	24 hours daily		918-865-4403

Station Name	Street Address	City	Access Type	Fill Type Code	PSI	Access Time	Cards Accepted	Station Phone
EZ Go #58	Mile 66.5 Indian Nation Turnpike	McAlester	Public	Q	3600	24 hours daily	Cash A D M V FuelMan Voyager Wright_Exp Comdata EFS FleetOne Tchek TCH	918-421-8940
Oklahoma Natural Gas - Miami Service Center	11 S Treaty Rd	Miami	Public - Credit card at all times	Q	3000 3600	24 hours daily	D M V FuelMan Voyager Wright_Exp	844-713-7987
OnCue Express #118	411 SW 4th	Moore	Public	Q	3600	24 hours daily	Cash A D M V FuelMan Voyager Wright_Exp	405-237-1185
7-Eleven #77	1920 S Eastern Ave	Moore	Public - Credit card at all times	Q	3600	24 hours daily	M V	405-793-1328
Oklahoma Natural Gas - Muskogee Service Center	2616 W Border St	Muskogee	Public - Credit card at all times	B	3000 3600	24 hours daily	D M V FuelMan Voyager Wright_Exp	844-713-7987
Oklahoma Natural Gas - Mustang Service Center	680 E Highway 152	Mustang	Public - Credit card at all times	B	3000 3600	24 hours daily	D M V FuelMan Voyager Wright_Exp	844-713-7987
Oklahoma Natural Gas - Norman Service Center	605 N Berry Rd	Norman	Public - Credit card at all times	B	3000	24 hours daily	D M V FuelMan Voyager Wright_Exp	844-713-7987
Love's Travel Stop #260	5317 SE 44th St	Norman	Public	Q	3600	24 hours daily	Cash Checks A D M V FuelMan GasCard Voyager Wright_Exp EFS FleetOne Tchek TCH	405-364-0059

Station Name	Street Address	City	Access Type	Fill Type Code	PSI	Access Time	Cards Accepted	Station Phone
City of Norman	2351 Goddard Ave	Norman	Public - Credit card at all times	B	3000 3600	24 hours daily	A D M V FuelMan GasCard Voyager Wright_Exp FleetOne	405-292-9709
Love's Travel Stop #274	102 W Copeland	Okemah	Public	Q	3600	24 hours daily	Cash Checks A D M V FuelMan Voyager Wright_Exp EFS FleetOne Tchek TCH	918-623-2024
OnCue Express #119	2837 NW 36th St	Oklahoma City	Public	Q	3600	24 hours daily	Cash A D M V FuelMan Voyager Wright_Exp	405-338-8552
7-Eleven #23	1 NE 36th St	Oklahoma City	PLANNED - not yet accessible (Public)	Q	3600	24 hours daily	Cash Checks M V	
Reno Partners - Conoco	3701 W Reno Ave	Oklahoma City	Public - Credit card at all times	Q	3600	24 hours daily	A D GasCard M V Voyager Wright_Exp	405-942-7528
Love's Country Store #245	3233 SW 89th St	Oklahoma City	Public	Q	3600	24 hours daily	Cash Checks A D M V FuelMan Voyager Wright_Exp EFS FleetOne Tchek TCH	405-686-1053
OnCue Express #191	4920 N Western Ave	Oklahoma City	Public - Credit card at all times	Q	3600	24 hours daily	M V FuelMan Voyager Wright_Exp	405-338-8552
OnCue Express #116	3901 NW Expy	Oklahoma City	Public	Q	3600	24 hours daily	Cash M V FuelMan Voyager Wright_Exp	405-942-0964

Station Name	Street Address	City	Access Type	Fill Type Code	PSI	Access Time	Cards Accepted	Station Phone
Oklahoma Natural Gas - Southside Service Center	412 SE 59th St	Oklahoma City	Public - Credit card at all times	B	3000 3600	24 hours daily	D M V FuelMan Voyager Wright_Exp	844-713-7987
Love's Travel Stop #203	800 S Morgan Rd	Oklahoma City	Public	Q	3600	24 hours daily	Cash A D M V FuelMan Voyager Wright_Exp EFS FleetOne Tchek TCH	405-789-0087
OnCue Express #126	TBD	Oklahoma City	PLANNED - not yet accessible (Public - Credit card at all times)	Q	3600	24 hours daily	M V FuelMan Voyager Wright_Exp	405-338-8552
OnCue Express #101 - C-Store	1 NW 23rd St	Oklahoma City	Public	Q	3600	24 hours daily	Cash M V FuelMan Voyager Wright_Exp	405-557-1170
Love's Travel Stop #205	12225 N I-35 Service Rd	Oklahoma City	Public	Q	3600	24 hours daily	Cash Checks A D M V FuelMan Voyager Wright_Exp EFS FleetOne Tchek TCH	405-478-5766
OnCue Express #100 - C-Store	5900 W Reno Ave	Oklahoma City	Public	Q	3600	24 hours daily; station can accommodate heavy-duty vehicles, however some maneuvering might be necessary	Cash M V FuelMan Voyager Wright_Exp	405-787-2255
Oklahoma City Solid Waste Division	11501 N Portland Ave	Oklahoma City	Public - Credit card at all times	Q	3600	24 hours daily	A D M V FuelMan Wright_Exp	405-749-3092

Station Name	Street Address	City	Access Type	Fill Type Code	PSI	Access Time	Cards Accepted	Station Phone
OnCue Express #112 - C-Store	13600 N Western Ave	Oklahoma City	Public	Q	3600	24 hours daily	Cash M V FuelMan Voyager Wright_Exp	405-752-4597
OnCue Express #117	7400 S Sooner Rd	Oklahoma City	Public	Q	3600	24 hours daily	Cash M V FuelMan Voyager Wright_Exp	405-733-1648
Clean Energy - Will Rogers World Airport	4424 Amelia Earhart Dr	Oklahoma City	Public - Credit card at all times	Q	3000 3600	24 hours daily; call 866-809-4869 for Clean Energy card	CleanEnergy D FuelMan M V Voyager Wright_Exp	866-809-4869
Oklahoma Natural Gas - Okmulgee Service Center	2018 S Wood Dr	Okmulgee	Public - Credit card at all times	Q	3000	24 hours daily	D M V FuelMan Voyager Wright_Exp	844-713-7987
Muskogee Nation Business Enterprise - Creek Nation Travel Plaza	2800 N Wood Dr	Okmulgee	PLANNED - not yet accessible (Public)	Q	3600	24 hours daily		918-752-0090
OnCue Express #357	TBD	Okmulgee	PLANNED - not yet accessible (Public - Credit card at all times)	Q	3600	24 hours daily	M FuelMan Voyager Wright_Exp	405-338-8552
Blue Energy Fuels - City of Owasso	101 S Main St	Owasso	Public - Credit card at all times	Q	3600	24 hours daily	D M V FuelMan Voyager Wright_Exp	918-641-2583
Love's Travel Stop #452	1601 W Airline Rd	Pauls Valley	Public	Q	3600	24 hours daily	Cash Checks A D M V FuelMan Voyager Wright_Exp EFS FleetOne Tchek TCH	405-207-9692

Station Name	Street Address	City	Access Type	Fill Type Code	PSI	Access Time	Cards Accepted	Station Phone
Oklahoma Natural Gas - Pauls Valley Service Center	1701 W Airline Rd	Pauls Valley	Public - Credit card at all times	B	3000	24 hours daily	D M V FuelMan Voyager Wright_Exp	844-713-7987
OnCue Express #16	1613 W South Ave	Ponca City	PLANNED - not yet accessible (Public)	Q	3600	24 hours daily	Cash A D M V FuelMan Voyager Wright_Exp	405-338-8552
Oklahoma Natural Gas - Ponca City Service Center	2205 N Ash St	Ponca City	Public - Credit card at all times	B	3000 3600	24 hours daily	D M V FuelMan Voyager Wright_Exp	844-713-7987
Poteau CNG	34042 Old Wister Hwy	Poteau	Public - Credit card at all times	Q	3600	24 hours daily	A D M V FuelMan Voyager Wright_Exp	918-649-5758
CNGnGo	4333 W 530 Rd	Pryor Creek	Public - Credit card at all times	Q	3600	24 hours daily	A D M V FuelMan Voyager Wright_Exp Comdata EFS FleetOne	918-581-4311
CNGnGo	2210 Industrial Rd	Sapulpa	Public - Credit card at all times	Q	3600	24 hours daily	A D M V FuelMan Voyager Wright_Exp Comdata EFS FleetOne	918-581-4311
Oklahoma Natural Gas - Sapulpa Service Center	410 S Hawthorn St	Sapulpa	Public - Credit card at all times	Q	3000 3600	24 hours daily	D M V FuelMan Voyager Wright_Exp	844-713-7987
Hutch's C-Store #120	610 NE Highway 66	Sayre	Public	Q	3600	24 hours daily	Cash A D M V Voyager Wright_Exp	580-928-3847
Capital CNG	3302 N Highway 99	Seminole	Public - Credit card at all times	Q	3600	24 hours daily	A D M V FuelMan Wright_Exp Comdata	405-382-0514

Station Name	Street Address	City	Access Type	Fill Type Code	PSI	Access Time	Cards Accepted	Station Phone
Oklahoma Natural Gas - Shawnee Service Center	1444 N Kickapoo St	Shawnee	Public - Credit card at all times	B	3000 3600	24 hours daily	D M V FuelMan Voyager Wright_Exp	844-713-7987
Clean Energy - Oklahoma State University	1323 W Lakeview Dr	Stillwater	Public - Credit card at all times	Q	3000 3600	24 hours daily; call 866-809-4869 for Clean Energy card	CleanEnergy D FuelMan M V Voyager Wright_Exp	866-809-4869
Oklahoma Natural Gas - Stillwater Service Center	3424 N Perkins Rd	Stillwater	Public - Credit card at all times	B	3000 3600	24 hours daily	D M V FuelMan Voyager Wright_Exp	844-713-7987
OnCue Express #314 - C-Store	1402 S Perkins Rd	Stillwater	Public	Q	3600	24 hours daily	Cash M V FuelMan Voyager Wright_Exp	405-624-9091
Northeast Oklahoma Public Facilities Authority - Stilwell	Rural Route 6	Stilwell	Public - Credit card at all times	Q	3600	24 hours daily	A D M V FuelMan Voyager Wright_Exp	918-696-4177
EZ Go #53	Mile 178 Turner Turnpike	Stroud	Public	Q	3600	24 hours daily	Cash A D M V FuelMan Voyager Wright_Exp EFS	918-968-2208
Conoco Outpost Convenience Store	17699 S Muskogee Ave	Tahlequah	PLANNED - not yet accessible (Public - Credit card at all times)	Q	3600	6am-10 pm daily	A D M V	918-456-5578
Northeast Oklahoma Public Facilities Authority - Tahlequah	853 N Woodard Ave	Tahlequah	Public - Credit card at all times	Q	3600	24 hours daily	A D M V FuelMan Voyager Wright_Exp	918-456-5621 918-456-3591

Station Name	Street Address	City	Access Type	Fill Type Code	PSI	Access Time	Cards Accepted	Station Phone
Chickasaw Indian Nation - Thackerville	22983 Brown Springs Rd	Thackerville	Public - Credit card at all times	Q	3600	24 hours daily	A D M V Voyager Wright_Exp Comdata EFS FleetOne	580-276-4706
Oklahoma Natural Gas - Tulsa Service Center West	7002 S Union Ave	Tulsa	Public - Credit card at all times	B	3000 3600	24 hours daily	D M V FuelMan Voyager Wright_Exp	844-713-7987
Timmons Oil Co	13001 E Admiral Pl	Tulsa	PLANNED - not yet accessible (Public)	Q	3600			
City of Tulsa	7952 E 33rd St S	Tulsa	PLANNED - not yet accessible (Public)	Q	3600			
Blue Energy Fuels - Tulsa Gas Technologies	4809 S 101 E Ave	Tulsa	Public - Credit card after hours	Q	3600	8am-5pm daily; Also accepts Tulsa Gas Technologies card	Cash D M V FuelMan Voyager Wright_Exp	918-641-2583
TruStar Energy - Tulsa	5011 S Vandalia Ave	Tulsa	Public - Credit card at all times	Q	3600	24 hours daily	A D M V FuelMan Voyager Wright_Exp	253-561-2870
Oklahoma Natural Gas - Tulsa Service Center	5848 E 15th St	Tulsa	Public - Credit card at all times	B	3000 3600	24 hours daily	D M V FuelMan Voyager Wright_Exp	844-713-7987
City of Tulsa West Maintenance Yard	420 W 23rd St	Tulsa	Public - Credit card at all times	Q	3600	5am-11pm M-F	M V	918-527-0002
Oklahoma Natural Gas - Tulsa North Service Center	4821 E 66th St N	Tulsa	Public - Credit card at all times	B	3000 3600	24 hours daily	D M V FuelMan Voyager Wright_Exp	844-713-7987

Station Name	Street Address	City	Access Type	Fill Type Code	PSI	Access Time	Cards Accepted	Station Phone
Sparq - Watonga	320 S Clarence Nash Blvd	Watonga	Public - Credit card at all times	Q	3600	24 hours daily	M V FuelMan GasCard Voyager Wright_Exp	844-772-7764
OnCue Express #353	32744 State Highway 45	Waynoka	Public - Credit card at all times	Q	3600	24 hours daily; station is heavy-duty accessible, but there is a tight turning radius	M V FuelMan Voyager Wright_Exp	405-338-8552
Fast Lane Travel Plaza	1501 N Airport Rd	Weatherford	Public	Q	3600	24 hours daily	Cash Checks A D M V FuelMan GasCard Voyager Wright_Exp EFS	580-772-6076 580-772-5618
Love's Travel Stop #255	214 S Highway 100	Webbers Falls	Public	Q	3600	24 hours daily	Cash Checks A D M V FuelMan Voyager Wright_Exp EFS FleetOne Tchek TCH	918-464-2865
OnCue Express #355	1605 Highway 2 S	Wilburton	Public - Credit card at all times	Q	3600	24 hours daily	M V FuelMan Voyager Wright_Exp	405-338-8552
Hutch's C-Store #113	3710 Oklahoma Ave	Woodward	Public - Credit card at all times	Q	3600	24 hours daily	A D M V Voyager Wright_Exp	580-256-2650
OnCue Express #122	1000 N Czech Hall Rd	Yukon	Public	Q	3600	24 hours daily	Cash M V FuelMan Voyager Wright_Exp	405-324-2083

Source: Association of Central Oklahoma Governments, Central Oklahoma Clean Cities, <http://www.okcleancities.org/cng> (June 7, 2016).

Appendix D: Energy Emergency Response Menu

The Energy Emergency Response Menu below was initially compiled in 2013. A review of state best practices was done in 2016, and no major updates were deemed warranted at that time. During the review, authors consulted NASEO documents and peer state Energy Assurance plans for all geographically and structurally similar states to Oklahoma.

Electricity Emergency Response Menu

Type of Emergency	Supply or Demand Side Management	Measure	What it Does	Recommended Steps	Recommended for Shortage Level
Electric	Supply	Participation in regional planning and transmission organizations (Southwest Power Pool)	SPP has the ability to shift power from state to state within its authorized region as a means of alleviating localized outages.	SPP can see each generating unit and transmission line and monitors these all year. OCC PUD maintains staff in active communication with SPP to update on status of shortages. Utilities can also go directly to SPP.	1
					2
					3
					4
Electric	Supply	Temporarily increase levels of coal stockpiling by electric utility companies.	Allows electric utilities to plan for predicted fuel shortages. By increasing stockpiles of necessary fuel above a 45 day supply, they will more easily handle the upcoming shortage.	Utilities may increase stockpiles without OCC input. Utility notifies OCC if stockpile exceeds 45 day supply and OCC regulates how much of the cost can be passed through in rate base after the fact.	2
					3
					4

Type of Emergency	Supply or Demand Side Management	Measure	What it Does	Recommended Steps	Recommended for Shortage Level
Electric	Supply	Temporarily substitute Oklahoma coal for Wyoming coal in coal-fired power plants.	In the event of a WY coal shortage, Oklahoma coal could be used to keep generation constant. OK coal is not of the same type as WY coal; therefore, waivers would be needed.	Utilities would contact DEQ and U.S. EPA to gain waivers to temporarily substitute one type of coal for another.	4
Electric	Supply	Reduction of voltage in the system.	Reduction of voltage by less than 5 or 6% can reduce the demands on the system, with most customers not being adversely impacted. * This short-term solution should be taken only after public notice has been given, as certain sensitive electrical equipment may be adversely affected, and would need to be protected.	Utilities would notify customers in conjunction with OCC, and then utilities would perform the voltage reduction.	4

Type of Emergency	Supply or Demand Side Management	Measure	What it Does	Recommended Steps	Recommended for Shortage Level
Electric	Supply	Utilize large backup generation when mobile units are available	Utilities and large industrial customers can install large generators that can supply from 75 to 100 megawatts of temporary diesel generation to ease electrical shortages.	OEM will facilitate communication between customers in need of backup generation and utilities, who maintain lists of priority restoration. Generator owners should be prepared to mobilize generators to appropriate locations once identified. OEM should coordinate request for backup generators with FEMA and US DOE, which can often provide emergency generators for critical infrastructure or fuel sites. OEM and the National Guard also have generator staging points that can be utilized.	4

Type of Emergency	Supply or Demand Side Management	Measure	What it Does	Recommended Steps	Recommended for Shortage Level
Electric	Supply	Use locomotive generators for electricity generation in selected locations.	Oklahoma has more useable freight rail lines than almost any other state. By using these rail lines, locomotives can be used as emergency electricity generation sources to provide electricity for critical facilities.	OEM should facilitate communications with OK DOT and OCC to determine rail line locations and feasibility of placing locomotives near centers of need.	4
Electric	Demand	Activate interruptible rates/curtailment programs	A load shedding mechanism whereby industrial customers receive a lower rate in exchange for willingness to have their service interrupted in times of high system demand.	All utilities have these programs currently in place and could activate curtailments as needed without State approval.	1
Natural Gas				Utilities must provide notice to the individual users prior to curtailing.	2

Type of Emergency	Supply or Demand Side Management	Measure	What it Does	Recommended Steps	Recommended for Shortage Level
Electric	Demand	Implement system-wide rolling blackouts	A load shedding mechanism that allows a utility to reduce the impacts realized from extended outages.	Utility must notify customers and OCC prior to outages beginning. Utility must determine the duration of the outages. Utility must consider if any customers should be exempted from the blackouts. Utility must coordinate with OEM and OCC to disseminate information on blackout locations and duration via media and use smart meters as possible to target outage locations.	4
Electric	Demand	Voluntary or mandatory curtailment of public building energy use	Load shedding mechanism that could mean reduced hours of operations to curtail energy use.	Utilities would communicate with OMES/Governor's Office regarding the need for energy reductions. Governor would issue an Executive Order closing buildings or modifying access.	3 4

Type of Emergency	Supply or Demand Side Management	Measure	What it Does	Recommended Steps	Recommended for Shortage Level
Electric	Demand	Employ and/or expand time-of-use rates for residential and/or industrial users	A load-shedding mechanism which creates strong financial incentives for consumers to use electricity at off-peak times. Programs are most effective with smart meters in place.	Utilities with programs already in place (OG&E and PSO) can employ these programs without input from state officials.	1
					2
					3
					4
Electric	Demand	Utilize capacity at sites with fuel switching or co-generation capabilities	A load shedding mechanism that can reduce electric demand on the grid.	Utility will contact co-generation site to request that the co-generation capacity be utilized to reduce their electric demand	3
					4
Electric	Demand	Conduct a public information program on home energy assessments	An assessment will show the problems that can, when corrected, increase residential energy efficiency, thus reducing electricity demand.	Utilities administer these programs and are responsible for promoting them.	1
				Utilities could be encouraged by OCC to more widely publicize the programs.	2
Electric	Demand	Implement a public information or incentive program to purchase more	A mechanism to reduce energy consumption	Utilities currently offer these incentives. State agencies including OCC and ODOC also promote these	1

Type of Emergency	Supply or Demand Side Management	Measure	What it Does	Recommended Steps	Recommended for Shortage Level
		efficient appliances, add insulation, or change lighting		incentives to the public. Consider increasing publicity/visibility in times of shortage.	2
Electric	Demand	Conduct a public information campaign to provide electricity saving tips	Encourages customers to reduce energy consumption	Utilities currently offer these promotional materials.	1
				Consider using public figures such as OCC Commissioners or Governor for PSAs regarding electricity conservation in times of shortage.	2
					3
					4
Electric	Demand	Increase rates for customers.	Higher prices discourage consumption during shortages.	Utilities must publicize the rate increases thoroughly to realize the conservation benefits.	2
			This type of short-term change could only feasibly be implemented in a self-regulated co-op or municipal utility setting.	Co-op board members or city governments must approve rate changes.	3
				The State has no authority over these changes as these are unregulated utilities.	4

Type of Emergency	Supply or Demand Side Management	Measure	What it Does	Recommended Steps	Recommended for Shortage Level
Electric	Demand	Encourage or direct government facilities to improve energy efficiency.	Reduces energy consumption	2012 SB 1096 mandates 20% savings in state facilities by 2020. The program is administered through the Office of State Finance and Secretary of Energy.	1
				61 Okla. St. § 213 mandates that new construction or substantial renovation projects in State buildings over 10,000 sq. ft. must meet a high-performance building standard.	2
				Shorter term measures could be coordinated through OMES and Governor (Executive Order in an emergency situation).	3
					4
Electric	Demand	Encourage or direct regulated utility providers to increase and/or provide additional programs to their customers which focus on energy efficiency	Reduces energy consumption	OCC can encourage additional programming at any time. Directing additional programming would be accomplished through a formal rulemaking process or legislation.	1

Type of Emergency	Supply or Demand Side Management	Measure	What it Does	Recommended Steps	Recommended for Shortage Level
Electric	Demand	Utilize buy-back rates that pay customers to sell excess self-generated electricity back to the grid for utility credit	Reduces the need for utility generation	The current State net metering policy already encourages customer self-generation but there are cost barriers to customers selling back to the grid.	1
Electric Natural Gas Propane	Demand	Encourage the use of alternative fuels, such as natural gas, propane, diesel or wood as the fuel source for home heating.	Provides alternative heating sources in event of electrical outages	Utilities, the Dept. of Health, Fire Marshall, and public figures should use PSAs and all media outlets to communicate the risks and benefits of safely using alternative fuels for home heating.	2 3 4

Petroleum Emergency Response Menu

Type of Emergency	Supply or Demand Side Management	Measure	What it Does	Recommended Steps	Recommended for Shortage Level
Petroleum	Supply	State of Oklahoma assumes control of fuel prioritization	63 O.S.2011, Section 683.9(1), gives the Governor authority to assume regulatory control over essential resources, to determine priority of such resources and allocate such resources.	The Governor's Office would coordinate with the Corporation Commission and OEM to determine the appropriate prioritization.	3
			Other than the statute, there are no pre-selected lists. The guiding principle is to give the flexibility needed to meet the demands of the situation.		4
Petroleum	Supply	Temporarily lift Federal Motor Carrier Safety Regulations (FMCSR) restrictions for over the road transport trucks.	Temporarily removes driver hour restrictions and various other regulations to allow for extended delivery hours by transit companies of petroleum products, such as LPG, gasoline, or diesel.	A Governor's Declaration of Emergency automatically lifts FMCSR. ⁶⁵ See Appendix F.	3
				Coordinate with surrounding states to ensure smooth interstate travel of equipment or fuel. ⁶⁶	4

⁶⁵ A NASEO template for model Executive Order language can be found at <https://www.naseo.org/Data/Sites/1/fmcsa-regulations-relief-guidance-11-03-2014.pdf>.

⁶⁶ Note: Truck size and weight relief is a state-by-state matter, where the Federal Highway Administration (FHWA) is the lead Federal agency.

Type of Emergency	Supply or Demand Side Management	Measure	What it Does	Recommended Steps	Recommended for Shortage Level
Petroleum	Supply	Top off fuel storage tanks in anticipation of an event that will impact gasoline transportation	Private petroleum retailers may choose to do this voluntarily to ensure available supply if a shortage is imminent.	Retailers will monitor potential shortages and act accordingly.	1
					2
					3
			This is currently a common practice for petroleum retailers.		4
Petroleum Propane	Supply	Encourage or require longer refill cycles, or waiting until tank is completely depleted before the tank could be refilled.	Caution is needed, as distributors may have difficulty efficiently scheduling routes with less predictable schedules, as well as ensuring that this option is not utilized in times of extreme cold.	Work in conjunction with the Governor's Office. OCC PST Division would encourage or direct petroleum delivery schedules to be modified on the basis of fuel need LPG board would have to be consulted regarding propane.	4
Petroleum	Supply	Request waivers from the U.S. EPA for the import of gasoline that does not meet local air quality requirements	Request should be substantiated with fuel supply/ consumption data for both impacted and alternative fuels, and include information on specific efforts to seek alternative sources of compliant fuels.	Waiver requests are made by, or on behalf of, a State's Governor's office after consultation with the EPA. Normally the EPA's point of contact is the State Air Division Director's Office (DEQ). See Appendix F.	4

Type of Emergency	Supply or Demand Side Management	Measure	What it Does	Recommended Steps	Recommended for Shortage Level
Petroleum	Supply	Request waivers from the U.S. EPA to allow for high sulfur diesel products to be used for highway consumption	Almost all diesel fuel available today is ultra-low sulfur diesel, which has significant air quality benefits over high sulfur diesel. But, vehicles or equipment with new emission control technology (2007 and later) can fail if run on high sulfur diesel.	DEQ would make the request to the U.S. EPA. Refineries would have to change their process requirements for sulfur content since almost all diesel today is ultra-low sulfur diesel. See Appendix F for detailed implementation instructions.	4
Petroleum	Supply	Petition the U.S. EPA to allow refineries to sell gasoline out of season or to suspend the Reid Vapor Pressure Standard (RVP) standard for gasoline allowing for more gasoline to be produced from a barrel of oil.	Seasonal blend requirements for gasoline force refineries to stockpile gasoline and not be allowed to sell it until a particular date. The RVP measures gasoline volatility. Suspending the RVP allows for more gasoline to be produced from a barrel of oil.	DEQ would make the request to the EPA after consultation with the Governor's Office. See Appendix F for detailed implementation instructions.	4

Type of Emergency	Supply or Demand Side Management	Measure	What it Does	Recommended Steps	Recommended for Shortage Level
Petroleum	Supply	Petition the U.S. Department of Energy or President for an exchange or release of crude oil from the U.S. Strategic Petroleum Reserve.	The Strategic Petroleum Reserve is an emergency response tool the President can use should the United States or individual states or regions be confronted with an economically-threatening disruption in oil supplies.	The Governor would make the petition to the U.S. DOE or President.	4
Petroleum	Demand	Conduct a public information campaign to encourage ridesharing	Has the potential to reduce vehicle fuel needs.	Governor's Office, OCC, DEQ and ODOT can coordinate with trade and municipal associations regarding fuel conservation.	2 3 4
Petroleum	Demand	Conduct a public information campaign to encourage efficient driving practices	Consumers can be encouraged to use the correct air pressure in tires, using driving practices which are targeted at improving fuel efficiency, removing wind resistant equipment such as luggage racks, and discouraging discretionary driving.	Coordinate with ODOT; coordinate with auto manufacturers.	1 2 3 4

Type of Emergency	Supply or Demand Side Management	Measure	What it Does	Recommended Steps	Recommended for Shortage Level
Petroleum	Demand	Trigger the Oklahoma Emergency Price Stabilization Act.	This may be enacted with the declaration of an emergency, and the Act forbids price increases in excess of 10%.	The trigger is the Governor's declaration of emergency through Executive Order. Enforcement by the Attorney General.	2
					3
Petroleum	Demand	Offer discounted rates or incentives for using any public transit options.	Reducing the cost of public transit encourages citizens to use this option rather than driving private vehicles.	The DEQ model for ozone alert days could be utilized.	3
					4
Petroleum	Demand	Increase the number or frequency of bus routes	See above.	See above.	3
					4
Petroleum	Demand	Reduce speed limits on roadways, and/or increase the enforcement of either lowered or existing speed limits.	Fuel efficiency usually decreases at speeds above 50 mph ⁶⁷ .	The Oklahoma Department of Transportation regulates speed limits and their enforcement through the State Patrol. Coordinate with Governor's Office.	3
					4

⁶⁷ U.S. Department of Energy, *Energy Efficiency and Renewable Energy, Driving More Efficiently*, <http://www.fueleconomy.gov/feg/drivehabits.shtml> (June 1, 2016).

Type of Emergency	Supply or Demand Side Management	Measure	What it Does	Recommended Steps	Recommended for Shortage Level
Petroleum	Demand	Create a public information campaign encouraging employers to offer telecommute or telework options.	For each day employees do not commute to the office, up to 20% of fuel can be conserved.	Issue PSAs from state leaders, authorized by the Governor.	3
					4
Petroleum	Demand	Enact/support a telework or telecommute policy for public employees	Reduces fuel consumption by roughly 20% weekly for each day employees do not commute to the office.	The Governor could declare this policy.	3
					4
Petroleum	Demand	Encourage staggered commute times (commuting off-peak hours or days) for public and/or private employers and/or school start times.	Reduces the amount of transit time in congested areas, and thereby reduces the amount of fuel consumed.	Governor could allow for public employees to use flex time. Public officials could encourage the private sector via PSA's.	3
					4
Petroleum	Demand	Curtail recreational marine or off-road vehicle use.	Reduces discretionary use of vehicle fuel.	The public safety department or GRDA would enforce curtailments of recreational use.	4
Petroleum	Demand	Encourage the use of alternative fuels such as CNG, biofuels, or diesel natural gas, especially in public and school fleets.	Converting a portion of fleets to a secondary fuel source creates a hedge against fuel shortage or emergency.	Department of Commerce SEO, OCC, private utilities, Secretary of Energy, and Governor could all be involved in promoting this initiative.	1
					2
					3
					4

Natural Gas Emergency Response Menu

Type of Emergency	Supply or Demand Side Management	Measure	What it Does	Recommended Steps	Recommended for Shortage Level
Natural Gas	Supply	Temporarily lift wellhead restrictions on the production of natural gas.	Allows companies to pump as much gas as possible.	OCC regulates this through rulemaking, every 6 months holding a market demand hearing which sets maximum flow for wells. This hearing can occur on an accelerated schedule if necessary (emergency rulemaking).	4
Natural Gas	Supply	Allow pipeline pack to increase reserve supplies available.	Allows pipeline companies to store additional natural gas in the pipelines. This is generally done in anticipation of elevated demand.	The allowable pipeline pressure increases are regulated by federal law.	1 2 3 4

Type of Emergency	Supply or Demand Side Management	Measure	What it Does	Recommended Steps	Recommended for Shortage Level
Natural Gas	Supply	Local gas distribution companies (LDC) can purchase additional gas to meet demand.	Mainly a preventative measure to be used when shortages can be anticipated — there must be an adequate gas supply available to purchase additional gas.	This activity will be conducted by private gas companies; OCC should remain actively involved in understanding anticipated supply shortages.	1
			The price of this purchased gas, contract details, the availability of gas transmission capacity, and the ability of the company's system to accept additional supply may impact the amount that can be purchased.		2
					3
Natural Gas	Supply	Gas companies that are drawing gas from storage facilities can increase the rate of withdrawal.	Helps meet increased short-term demand.	No special permissions needed. Companies make these decisions independently--contractually they may go up to their maximum withdrawal rate without notifying state officials.	2

Type of Emergency	Supply or Demand Side Management	Measure	What it Does	Recommended Steps	Recommended for Shortage Level
Natural Gas	Supply	Encourage/require gas companies when technically feasible to access and use other sources of gas, (LNG, propane air stations, synthetic natural gas plants).	Diversifies fuel sources, decreasing reliance on natural gas.	Would require that conversion equipment exists and the companies would be buying gas “off system.”	4
Natural Gas	Demand	Encourage/ require a short-term reduction in natural gas usage in state facilities or by industrial users.	Temporarily relieves demand on the natural gas system.	Governor has authority over state facilities. OEM would coordinate communication requirements or encouragement for industrial users. OCC becomes involved if curtailment issues arise.	3 4
Natural Gas	Demand	Request that large commercial and industrial customers reduce gas use by decreasing their thermostat settings or reducing gas-consuming industrial processes.	See above.	OCC is involved through interruptible gas rates. Once signed up the utility has the discretion how to execute the curtailment.	1 2 3 4
Natural Gas	Demand	Encourage residential customers to lower thermostats and water heating settings and defer using gas appliances	See above.	A utility or the state could issue PSA’s to consumers to encourage their participation.	2 3 4

Type of Emergency	Supply or Demand Side Management	Measure	What it Does	Recommended Steps	Recommended for Shortage Level
Natural Gas	Demand	Curtail or shut off gas supply to customers, regardless of interruptible agreements in place.	Assures reduction in natural gas use for serious shortage situations.	Utilities should use this approach with caution, as customer pilot lights must be relit following a cut off, or serious hazards such as gas accumulation within residences and business, could result.	4+
Natural Gas	Demand	Increase retail rates to consumers.	Higher cost often reduces consumption.	Requires a statutory change and emergency rulemaking.	4+
Natural Gas	Demand	Conduct a public information campaign and/or offer incentives that provide information, energy estimates, or discounts for the purchase and installation of highly efficient natural gas appliances.		Financial incentive programs are administered at the utility level but are authorized at OCC.	1
					2
					3
					4
Natural Gas	Demand	Encourage large industrial natural gas customers to participate in a gas buy-back program.	Some larger industrial customers purchase gas from 3rd party suppliers and pay only a transportation fee to the utility. In a shortage situation, certain large customers may be willing to interrupt operations if the buy-back premium is high enough.	This would be a transaction in the private sector.	4

Appendix E: Sperry-Piltz Ice Accumulation (“SPIA”) Index

More complete information, forecasting tools and weather analysis can be found at the SPIA website, www.spia-index.com.

The Sperry-Piltz Ice Accumulation Index, or “SPIA Index” – Copyright, February, 2009

ICE DAMAGE INDEX	* AVERAGE NWS ICE AMOUNT (in inches) *Revised-October, 2011	WIND (mph)	DAMAGE AND IMPACT DESCRIPTIONS
0	< 0.25	< 15	Minimal risk of damage to exposed utility systems; no alerts or advisories needed for crews, few outages.
1	0.10 – 0.25	15 - 25	Some isolated or localized utility interruptions are possible, typically lasting only a few hours. Roads and bridges may become slick and hazardous.
	0.25 – 0.50	> 15	
2	0.10 – 0.25	25 - 35	Scattered utility interruptions expected, typically lasting 12 to 24 hours. Roads and travel conditions may be extremely hazardous due to ice accumulation.
	0.25 – 0.50	15 - 25	
	0.50 – 0.75	< 15	
3	0.10 – 0.25	> = 35	Numerous utility interruptions with some damage to main feeder lines and equipment expected. Tree limb damage is excessive. Outages lasting 1 – 5 days.
	0.25 – 0.50	25 - 35	
	0.50 – 0.75	15 - 25	
	0.75 – 1.00	< 15	
4	0.25 – 0.50	> = 35	Prolonged & widespread utility interruptions with extensive damage to main distribution feeder lines & some high voltage transmission lines/structures. Outages lasting 5 – 10 days.
	0.50 – 0.75	25 - 35	
	0.75 – 1.00	15 - 25	
	1.00 – 1.50	< 15	
5	0.50 – 0.75	> = 35	Catastrophic damage to entire exposed utility systems, including both distribution and transmission networks. Outages could last several weeks in some areas. Shelters needed.
	0.75 – 1.00	> = 25	
	1.00 – 1.50	> = 15	
	> 1.50	Any	

(Categories of damage are based upon combinations of precipitation totals, temperatures and wind speeds/directions.)

Weather Conditions and SPIA Index Levels at a Glance:

Ice and Wind: *Average NWS Ice in Inches; Wind in MPH.	< 15 mph	15-25 mph	25-35 mph	> = 35 mph
0.10 – 0.25 inches	0	1	2	3
0.25 – 0.50 inches	1	2	3	4
0.50 – 0.75 inches	2	3	4	5
0.75 – 1.00 inches	3	4	5	5
1.00 – 1.50 inches	4	5	5	5
> 1.50 inches	5	5	5	5

SPIA Index © 2009, Sidney K. Sperry. Registration Number TX 7-027-591. *Graphics revised – October, 2011

Appendix F: Implementation Actions

Issuing Waivers from Federal Motor Carrier Safety Regulations in an Energy Emergency

The following are examples of executive orders issued by the Governor in previous emergency situations which lifted Federal Motor Carrier Safety Administration (“FMCSA”) regulations during an energy emergency. These orders can be used as models for the future and altered to fit the precise circumstances needing to be addressed. It is important to note that without a formal declaration of emergency, the Governor could still issue an Executive Order that grants a waiver from FMCSA regulations for a particular sector, such as propane. It is also important to note that the waiver applies to any carrier providing direct relief or support to recovery efforts for the emergency situation and is not industry-specific.

After the Governor’s issuance of an Executive Order, NASEO recommends the following steps to ensure that affected groups are aware of the waiver being in effect:

1. Post a copy of the Governor’s emergency declaration on a publicly available website and provide a link to the emergency declaration as part of notifications made to State, local, and federal agencies and the motor carrier industry.
2. Notify the motor carrier safety enforcement agency of State government that an emergency has been declared, in what part of the State it been declared, and that as a result of this declaration the safety regulations are temporarily waived.
3. Provide notification of emergency declaration to the FMCSA State office and regional administrator.
4. Notify motor carrier industry associations or motor carriers servicing the State directly through any automated system to quickly communicate with the industry. This communication should encourage, but not require, drivers transporting fuels to the areas in which an emergency has been declared to have with them a copy of the emergency declaration and a copy of the website link from the declaration can be printed.
5. Provide notification to State Energy Emergency Assurance Coordinators (see page 85 of this Plan) in those states within the region that may have motor carriers passing through them to provide relief in the affected state. It is also advisable to coordinate with neighboring states in advance of this declaration, if possible.



Mary Fallin
Governor

FILED

SEP 20 2012

**OKLAHOMA SECRETARY
OF STATE**

**EXECUTIVE DEPARTMENT
SECOND AMENDED EXECUTIVE ORDER 2012-21**

I, Mary Fallin, Governor of the State of Oklahoma, pursuant to the authority vested in me by Section 2 of Article VI of the Oklahoma Constitution, hereby declare the following:

1. Due to Exceptional and Extreme Drought conditions existing in 77 counties in Oklahoma, and the severe wildfires beginning July 22, 2012, and continuing, I issued Executive Order 2012-21 on July 30, 2012, and thereby declared a disaster emergency caused by wildfires and drought in the State of Oklahoma that threatened the lives and property of the people of this State and the public's peace, health, and safety. I issued amended Executive Order 2012-21 on August 24, 2012 due to continued drought conditions. Because said conditions warranting the issuance of Executive Order 2012-21 remain, I hereby amend Executive Order 2012-21 according to the terms contained herein.

This declaration may be amended as conditions warrant.

2. It may be necessary to provide for the rendering of mutual assistance among the State and political subdivisions of the State with respect to carrying out disaster emergency functions during the continuance of the State emergency pursuant to the provisions of the Oklahoma Emergency Management Act of 2003.
3. State agencies, in responding to this disaster emergency, may make necessary emergency acquisitions to fulfill the purposes of this proclamation without regard to limitations or bidding requirements on such acquisitions.
4. The State Emergency Operations Plan has been activated and resources of all State departments and agencies available to meet this emergency are hereby committed to the reasonable extent necessary to protect lives and to prevent, minimize, and repair injury and damage. These efforts shall be coordinated by the Director of the Department of Emergency Management with comparable functions of the federal government and political subdivisions of the State.

Further, pursuant to the authority vested in me by Sections 1 and 2 of Article VI of the Oklahoma Constitution and 63 O.S. §§ 683.1 et seq., hereby declare that because there is a state of emergency existing in the State of Oklahoma due to extremely dry weather and lack of significant rainfall, it is necessary to assist and expedite all efforts of drought relief and wildfire suppression. In order to accommodate this need and to provide assistance to the citizens of Oklahoma in this extraordinary situation, I hereby order the temporary suspension of the following as they apply to vehicles used in the support efforts:

045696

- A. The requirements for special permits for use of oversized vehicles under Title 47 only when transporting hay. These vehicles shall not exceed 12' in width and 13' 6" in height.
- B. The requirements for licensing/operating authority as required by the Oklahoma Corporation Commission;
- C. The requirements for licensing/registration as required by the Oklahoma Tax Commission;
- D. The requirements contained in the Motor Carrier Safety Regulations, under the authority of CFR 49, Part 390.23. All other regulations in CFR 49 shall apply.

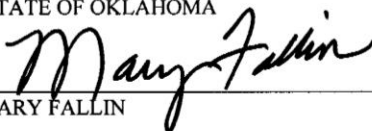
Due to the severe drought conditions occurring statewide it is necessary to expedite access to hay for livestock. In order to accommodate this need and to provide assistance to our farmers and ranchers in this extraordinary situation, I hereby order the temporary suspension of the requirements for special permits for use of oversized vehicles under Title 47 as they apply to vehicles used to transport round baled hay for livestock as outlined above.

- 5. This Amended Executive Order shall terminate at the end of thirty (30) days.

Copies of this Amended Executive Order shall be distributed to the Oklahoma Corporation Commission, the Oklahoma Tax Commission, the Commissioner of Public Safety, and the Director of Emergency Management who shall cause the provisions of this order to be implemented by all appropriate agencies of state government.

IN WITNESS WHEREOF, I have hereunto set my hand and caused the Great Seal of the State of Oklahoma to be affixed at Oklahoma City, this 21st day of September, 2012.

BY THE GOVERNOR OF THE STATE OF OKLAHOMA


MARY FALLIN





Mary Fallin
Governor

FILED

JUL 03 2012

**OKLAHOMA SECRETARY
OF STATE**

EXECUTIVE DEPARTMENT

AMENDED EXECUTIVE ORDER 2012-16

I, Mary Fallin, Governor of the State of Oklahoma, pursuant to the power vested in me by Section 2 of Article VI of the Oklahoma Constitution hereby declare the following:

1. Tornadoes, straight line winds, flash flooding and hail storms beginning May 29, 2012, and that are continuing, have caused extensive damage to public and private properties within the State of Oklahoma; and said damages have caused an undue hardship on the citizens of this state.
2. It may be necessary to provide for the rendering of mutual assistance among the State and political subdivisions of the State with respect to carrying out disaster emergency functions during the continuance of the State emergency pursuant to the provisions of the Oklahoma Emergency Management Act of 2003.
3. There is hereby declared a disaster emergency caused by the tornadoes, straight line winds, flash flooding and hail storms in the State of Oklahoma that threaten the lives and property of the people of this State and the public's peace, health and safety. The counties included in this declaration are:

Alfalfa, Blaine, Bryan, Caddo, Canadian, Cleveland, Comanche, Cotton, Creek, Custer, Dewey, Ellis, Garfield, Garvin, Grady, Grant, Harper, Kingfisher, Kiowa, Latimer, Lincoln, Logan, Love, Major, McClain, Oklahoma, Okmulgee, Pittsburg, Pottawatomie, Stephens, Tillman, Tulsa, Washita, Woods, and Woodward.

This declaration may be amended to add counties as conditions warrant.

4. The State Emergency Operations Plan was activated on May 29, 2012, and resources of all State departments and agencies available to meet this emergency are hereby committed to the reasonable extent necessary to protect lives and to prevent, minimize and repair injury and damage. These efforts shall be coordinated by the Director of the

045559

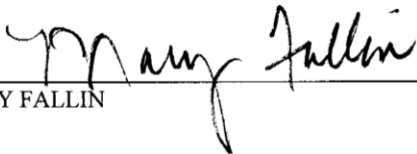
Department of Emergency Management with comparable functions of the federal government and political subdivisions of the State.

5. State agencies, in responding to this disaster emergency, may make necessary emergency acquisitions to fulfill the purposes of this proclamation without regard to limitations or bidding requirements on such acquisitions.
6. This Executive Order shall terminate on Tuesday, July 3, 2012.

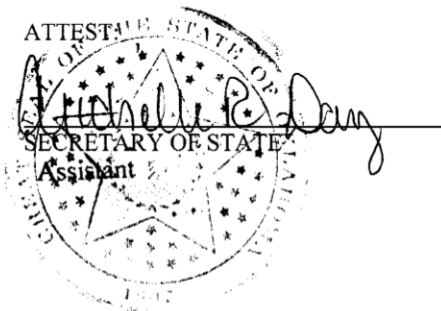
Copies of this Executive Order shall be distributed to the Director of Emergency Management who shall cause the provisions of this order to be implemented by all appropriate agencies of state government.

IN WITNESS WHEREOF, I have set my hand and caused the Great Seal of the State of Oklahoma to be affixed at Oklahoma City, Oklahoma, this 3rd day of July, 2012.

BY THE GOVERNOR OF THE STATE OF OKLAHOMA



MARY FALLIN



Requesting a Fuels Waiver

In the event of a fuel supply emergency, the U.S. EPA, with the concurrence of the U.S. Department of Energy, may temporarily waive a fuel or fuel additive requirement if doing so will alleviate the fuel supply emergency. The Clean Air Act Section 211(c)(4)(C), which authorizes fuels waivers, specifies the criteria for granting a fuels waiver, and the conditions that must be included in a fuels waiver.

According to the U.S. EPA,⁶⁸ a formal written request for a fuels waiver should be made by or on behalf of the Governor of an affected state or territory, and be directed to the U.S. EPA Administrator. The request should describe how the fuels waiver criteria specified in Clean Air Act have been met. In particular, the waiver request should address the following:

- The nature of the Act of God or other event that caused the shortage
- An explanation of why the shortage was not foreseeable and could not have been prevented by prudent planning on the part of the suppliers of the fuel
- The type of fuel for which a shortage exists
- The geographic area that is affected
- The effect of the shortage on fuel supplies, such as the number of gasoline stations that are, or are expected to be, out of fuel
- The expected duration of the shortage
- The specific nature of the waiver being requested, including the duration, the geographic area, and the alternative fuel that would be allowed

During normal business hours (Monday through Friday, 8 a.m. to 5 p.m.), the first point of contact for obtaining information about a fuels waiver request is the U.S. EPA Air Enforcement Division, at 202-564-2260, or the Transportation and Regional Programs Division, at 734-214-4956.

Outside of normal business hours, the point of contact is the U.S. EPA Emergency Operations Center, at 202-564-3850, which is able to communicate with the U.S. EPA officials who provide assistance regarding fuels waiver requests.

⁶⁸ <https://compliancegov.zendesk.com/hc/en-us/articles/212101757-What-is-the-procedure-for-formally-requesting-a-fuels-waiver->

Written fuels waiver requests should be addressed to:

Administrator
U.S. Environmental Protection Agency
1200 Pennsylvania Avenue, N.W.
Washington, DC 20460

The request should be sent to:

Assistant Administrator for Enforcement and Compliance Assurance
Mail Code 2201A, Room AR 3204
U.S. Environmental Protection Agency
1200 Pennsylvania Avenue, N.W.
Washington, DC 20460

A copy of the waiver request also should be sent by fax to the following telephone numbers:
(202) 501-3842, (202) 564-0069, and (303) 312-6003.