Oklahoma Energy Assurance Plan

April 2013
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An annual review of this plan should be conducted to update contact information, law and rule changes, and energy-related data.

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At each 5-year anniversary of the plan’s writing, consider a full plan update and re-write.

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ACKNOWLEDGEMENTS

The Oklahoma State Energy Office would like to thank the Oklahoma Corporation Commission’s Public Utility Division and the University of Oklahoma’s Center for Risk and Crisis Management for their assistance in drafting this Plan.

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

CenterPoint Energy

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 Office

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, to wind and also geothermal energy. These resources, as well as additional out-of-state sources such as coal, provide energy for 3.8 million Oklahoma residents, over 300,000 companies, and over 3.3 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 also planning for and responding when energy disruptions and emergencies occur.

Each year, Oklahoma faces a variety of energy disruptions. Most of these disruptions are limited in scope, but at times energy disruptions extend over wider areas, impact large segments of the population, or can last for long periods of time, threatening the life, health, and welfare of Oklahoma residents and creating energy emergencies. These energy emergencies are highly complex, varying in cause, form, duration, and severity. In fact, as of 2012, Oklahoma is the third most-disaster prone state in the nation, as measured by the number of Disaster Declarations issued each year.\(^1\) 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 particular coordinated action and makes a state Energy Assurance Plan even more critical.

Above all, government is charged with ensuring the safety and well being of its citizens, and in Oklahoma, energy assurance responses are considered a subset of the overall state emergency response activities. To address emergencies of all types, Oklahoma has an Emergency Operations Plan (EOP) in place which 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). This plan defines the roles of local, state and federal governmental entities in providing disaster relief and assistance; it also contains 15 Annexes, which assign responsibility to identified state agencies and volunteer service organizations during specific types of emergencies. Energy emergency responsibilities are outlined in the Energy Annex, ESF-12.

The document below, the Oklahoma Energy Assurance Plan (EAP), is intended to complement the state’s official Emergency Operations Plan’s Energy Annex by providing detailed background information about Oklahoma’s energy landscape, 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 prevent or manage those emergencies. The plan first 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 that will assist officials in closely monitoring the 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 four phases of energy assurance.

After providing an overall framework, the Energy Assurance Plan profiles each of Oklahoma’s major energy sectors—electricity, natural gas, and crude oil and petroleum—through the presentation of information on energy consumption as well as provider production capacities, infrastructure under management, and programs administered.

Next, the plan assesses the state’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 outlines examples of sector interdependencies between energy sources that should be considered in energy planning activities, as these may affect recovery efforts during emergency situations.

After providing a detailed view of Oklahoma’s energy landscape, the plan turns to a detailed description of the responsibilities of the various governmental agencies in responding to an energy emergency. In particular it discusses communication procedures between and across governmental agencies during energy emergencies, as well as explains the way in which 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: first, a set of preventative strategies and measures designed to mitigate the impact of an emergency prior to its occurrence, and second, a detailed menu of supply and demand response options that officials may wish to consider should an energy emergency impact the state. This section also discusses cybersecurity planning.

The Energy Assurance 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 Oklahoma may experience and outlines a wide variety of measures that might be utilized to respond, the document does not claim to provide an exhaustive review of every potential cause of emergency nor every potential remedy.

The Oklahoma State Energy Office, located within the Oklahoma Department of Commerce, maintains final responsibility for Oklahoma’s Energy Assurance Plan. Questions and comments about this plan can be directed at any time to Kylah McNabb at (405) 815-5249 or Kylah_McNabb@odoc.state.ok.us.
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 lengthy periods of time, threatening the life, health, and welfare of Oklahoma residents. For instance, in December 2007 Oklahoma experienced one of the most disruptive ice storms in the state’s history. An estimated 600,000 homes and businesses across the state 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 the power outages.

Events of this nature, which we refer to as energy emergencies, are highly complex and come in many forms. Forms of energy emergencies range from blackouts and pipeline explosions to petroleum shortages. Adding to this complexity, there are many different causes of energy emergencies—including spikes in demand during peak energy use, unanticipated power plant or refinery shutdowns, transmission system congestion, and natural disasters. Given this expansive scope, inherent complexity, and public risk, planning for and responding to energy emergencies in the state of Oklahoma often requires government action.

To address emergencies of all types, the State of Oklahoma has an Emergency Operations Plan (EOP) in place which 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). 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 (ESF’s) that assign responsibility to identified state agencies/departments and volunteer service organizations during specific types of emergencies—energy emergency responsibilities are outlined in ESF-12.

The document below, the Oklahoma Energy Assurance Plan (EAP), is intended to complement the state’s official Emergency Operations Plan, Energy Annex (ESF-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 stakeholders to consider as

2 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.
they prevent and manage those emergencies. The Energy Assurance 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 that can be generically applied 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 Energy Assurance Plan 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 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; these are noted in the appropriate sections of the Plan. In other cases, communications channels are less formal but nevertheless critical to maintain in order to facilitate an effective response should emergencies arise. Key governmental contacts for energy emergency response are maintained by the Office of Emergency Management (OEM), by the Oklahoma Corporation 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 Oklahoma Corporation Commission.

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 will 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 Oklahoma Department of Commerce, maintains final responsibility for Oklahoma’s Energy Assurance Plan. Questions and comments about this plan can be directed at any time to Kylah McNabb at (405) 815-5249 or Kylah_McNabb@odoc.state.ok.us.

CONTENTS OF THE PLAN
With the previous discussion in mind, the following sections comprise the Energy Assurance Plan (EAP) 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 that will 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 four phases of energy assurance.
After providing the overall framework for energy assurance planning, the EAP profiles each of Oklahoma’s major energy sectors—electricity, natural gas, and crude oil and petroleum—through the presentation of information on energy consumption as well as provider production capacities, 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 outlines examples of sector interdependencies between energy sources that should be considered in energy planning activities, as these may affect recovery efforts during emergency situations.

In the following section, the Plan turns to a detailed description of the responsibilities of the various governmental agencies that have responsibilities in the event of an energy emergency.

The Energy Emergency Communications Procedures section of the Plan moves on to discuss communication procedures between and across governmental agencies during energy emergencies. After discussing internal communication, the Plan explains the way in which public information must be disseminated to citizens of Oklahoma during energy emergencies.

The final section of the Plan focuses on the specific response strategies for energy events: first, a set of preventative strategies and measures designed to minimize the impact of an emergency prior to its occurrence, and second, a detailed menu of supply and demand response options that officials may wish to consider should an energy emergency impact the state. This section also discusses cybersecurity planning.
OVERVIEW OF ENERGY ASSURANCE PLANNING

IDENTIFYING AND CATEGORIZING ENERGY EMERGENCIES

Energy emergencies come in many forms; however, most emergencies can be categorized into one of two types—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 also 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 the provision of energy service is interrupted, and public demand for energy cannot be met at any price. This type of emergency is generally caused by damage to local distribution infrastructure. 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, earthquakes, tornados, ice, flooding, drought, etc.), accidental damage during construction, and/or mechanical failure due to faulty or aging transmission or distribution lines.

Supply Shortages

In other instances, an energy emergency can take the form of a 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 the repair of local infrastructure, responses to supply shortages generally involve increasing supply or decreasing demand. In such instances state officials often play a more significant role, by encouraging reductions in consumption or temporarily lifting constraints on the supply of energy resources.

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 supply of energy and causes that stimulate an abnormal spike in demand. Factors that might limit the supply of energy include major infrastructure damage like pipeline explosions or natural disasters that impair refineries; disruptions in transportation caused by tanker groundings, damage to railways, or unsuitable driving conditions; and/or international events that radically increase the price or curtail the supply of energy from our
trading partners abroad. Variables that could cause spikes in demand include economic upswings that spur dramatic increases in consumption, abnormal weather patterns (such as extreme heat or cold for prolonged periods of time) that bring about an unexpected increase in demand for electricity, and/or crisis events (such as September 11, 2001) that strike fear and uncertainty in the general public causing 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) guidelines to define four levels of energy shortages. These levels are intended to be broad guidelines which illustrate the fact that shortages differ with regard to severity. In reality, the severity of each energy emergency is multidimensional and will require a qualitative assessment prior to categorization. This qualitative assessment should include a look at the number of people (meters) affected, the vulnerability of the affected population, and the circumstances surrounding the incident. For instance, even 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 interruptions in electric transmission/distribution.

- **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.
- Severe infrastructure damage causing widespread interruptions in electric transmission/distribution.

- **Situation threatens to disrupt or diminish public health, safety, welfare, and/or economic vitality.**

**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, it should be noted that 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

Due to the complex and potentially catastrophic nature of energy emergencies, managing them requires that governmental officials look beyond the traditional idea of emergency response planning, which is predominantly reactive, towards energy assurance as a whole, which incorporates a number of proactive and preemptive actions designed to prepare for emergencies prior to their occurrence, mitigate their potential impact, and learn from them after governmental action has been 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: preparation and planning, mitigation and response, and education 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 severity of disruptions, 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, the National Association of State Energy Officials (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 at each of the four phases of emergency management.
**Phase I: Monitor and Alert**
Phase I involves the ongoing monitoring of energy supplies, public demand, and prices. During this phase, State agencies continuously monitor data and information as it becomes available through energy supply reporting systems, paying special 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 in order to ensure that they have the best and most recent information. This data then is used to evaluate the potential severity of the upcoming emergency, to locate the population that is likely to be influenced, and to determine whether or not governmental action is necessary.

**Phase III: Actions and Feedback**
If the decision is made that government action is necessary to ensure the health, welfare, and safety of Oklahoma citizens, 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 nature of the problem involves multiple states, information sharing among state energy coordinators
- If implementation of voluntary programs or other emergency deterrent actions fail to mitigate the emergency, begin implementing additional actions
- If the situation continues to deteriorate, recommending that a “State of Energy Emergency” be declared by the Governor, which will enable advanced response measures and activate federal assistance (if necessary)
- Continued monitoring of energy supply and demand to determine if governmental action is 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 the supply disruption tracking system put in place in Oklahoma can be 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. Department of Energy’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
Energy Information Administration (http://www.eia.doe.gov/)
Provides a wide range of information and data covering energy production, stocks, demand, imports, exports, and prices; and prepares analyses and special reports on topics of current interest.

A monthly publication about recent energy statistics; includes 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; published Monday through Friday to inform stakeholders of developments affecting energy systems, flows, and markets, it provides
highlights of energy issues rather than a comprehensive coverage; covers major energy developments in electricity, petroleum, and natural gas industries; energy prices; and other relevant news.

Contains impact studies on the disruption to energy infrastructure caused by major disasters such as hurricanes, the 2003 blackout, west coast wildfires, etc.

**NOAA** ([http://www.cpc.ncep.noaa.gov/products/analysis_monitoring/cdus/degree_days/](http://www.cpc.ncep.noaa.gov/products/analysis_monitoring/cdus/degree_days/))
The National Weather Service and National Oceanic and Atmospheric Administration provides data on cooling and heating degree days; this can be helpful to anticipate 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.nwc.ou.edu/](http://www.nwc.ou.edu/))
The University of Oklahoma hosts the National Weather Center, which is a unique confederation of University of Oklahoma, National Oceanic and Atmospheric Administration and state organizations that work together in partnership to improve understanding of events occurring 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.doe.gov/cneaf/electricity/epm/epm_sum.html](http://www.eia.doe.gov/cneaf/electricity/epm/epm_sum.html))
Monthly report on electricity sales and electricity production, including the quantity of fuel used and kilowatt-hour produced; the report is published by state, month, and sector.

**Quarterly Coal Report**
([http://www.eia.doe.gov/cneaf/coal/quarterly/qcr_sum.htm](http://www.eia.doe.gov/cneaf/coal/quarterly/qcr_sum.htm))
Quarterly report that lists the amount of coal consumed in each state and the price paid by each sector; estimates level of fuel inventories by each utility; reported by the number of days of supply on hand at each location for coal- and oil-fired plants.

**Regional System Reliability Forecast**
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**
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*
Provides data on natural and supplemental gas production, supply, consumption, disposition, storage, imports, exports, and prices in the United States; the report is published by state, month, and sector.

*CNGNow*
(www.CNGNow.com)
Provides information on the location and price of Compressed Natural Gas for vehicle fuel nationwide.

*U.S. Department of Transportation, Pipeline & Hazardous Materials Safety Administration*
Provides information on pipeline incidents that may affect supply by state.

Monitoring Petroleum

*EIA Reports*
(http://www.eia.gov/petroleum/reports.cfm?t=214)
The EIA collects and analyzes a host of data on petroleum prices, inventories, as well as public demand; reports are available on a weekly, monthly, and yearly basis.

*American Petroleum Institute*
(http://www.api.org/statistics/)
The API published information on the average price of gasoline at the pump, the countries the U.S. imports of oil and product from, as well as state motor fuel tax rates.

*Federal Highway Administration*
(http://www.fhwa.dot.gov/policyinformation/quickfinddata/qffuel.cfm)
The FHA publishes data on the amount of motor fuel usage throughout the United States; provided on a monthly and annual basis.

*GasBuddy*
(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 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 the comparable functions of the federal government, of the other states and localities, and of private agencies of every type, to the end that the most effective
preparation and use may be made of available workforce, resources and facilities for dealing with
disaster and hazard mitigation. Each state agency, board, commission, department or other state entity
having responsibilities either indicated in the state Emergency Operations Plan must have written plans
and procedures in place to protect individual employees, administrators and visitors from natural and
man-made disasters and emergencies occurring at their work place. All such plans and procedures are
made in concurrence with OEM, which is responsible for establishing an OEM Guidebook titled the
Emergency Standard Operating Procedures. Each state agency, board, commission, department or other
state entity must provide an annual report on the status of their 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 response to
dangerous substance incidents or events necessary 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 the duplication of effort
between local, country and state entities. Finally, the Act sought to organize, prepare and coordinate all
state available manpower, materials, supplies, equipment, facilities and services necessary for
dangerous substance response.

**Oklahoma Emergency Price Stabilization Act (15 O.S. § 777.1)**
In 1999, Oklahoma enacted the Oklahoma Price Stabilization Act to prevent unwarranted price increases
shortly after the occurrence of a disaster in the state. Once the Governor or President has declared a
state of emergency, the bill prohibits prices from rising more than 10 percent in the covered area.
Violators will face up to a year in prison and a fine of up to $1,000, as well as 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) as well as establishing
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, 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 OKOHS
as the agency responsible for developing interoperable public safety communications planning for the
state.

**Federal Authority**
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 utilize 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.

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 a description of the functional relationships within DHS and across the Federal
Government related to critical infrastructure security and resilience by June 2013; analyze the existing
public-private partnership model and recommend options for improving the effectiveness of the
partnership in both the physical and cyber spaces by July 2013; convene a team of experts to identify
baseline data and systems requirements to enable the efficient exchange of information and intelligence
relevant to strengthening the security and resilience of critical infrastructure by August 2013;
demonstrate a near real-time situational awareness capability for critical infrastructure by October
2013; 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_
The Federal Emergency Management Agency (FEMA), following a presidential declaration of emergency
or 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 the 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).

**Local Authority**

Oklahoma statutes 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 Office of Emergency Management’s website. Any incorporated municipality must either have their 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 statute requires that localities coordinate their plans with state level officials.

In the case that an emergency occurs which 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.

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5 2006 O.S. § 683.11: Local emergency management organization – Functions - Contracts
ENERGY PROFILE FOR OKLAHOMA

This section of the plan provides a summary description of Oklahoma’s energy use and expenditures in order 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 in order 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 sustained economic development in Oklahoma. Although production from the Oklahoma oil and gas industry has declined over several decades, 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 that, in recent years, have accounted for over three-fourths of Oklahoma oil production and about one-tenth of the state’s natural gas production. High prices for oil also have slowed the production decline.

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 rapid increase in supply has driven down natural gas prices. 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 2010, Oklahomans consumed approximately 413 million Btu of energy per capita, which ranks 11th in the U.S. In total, this amounted to 1,552 trillion Btu of energy consumed in the state, when accounting for consumption plus net interstate flow of electricity. Oklahoma’s higher-than-average per capita energy consumption is due in part to the state’s robust, yet energy-intensive oil and gas industry. It is also due in part to Oklahoma’s natural climate, which can bring both extreme heat in the summer and
cold in the winter, driving up the need for climate control in residences and businesses. Of the energy consumed in Oklahoma in 2010, approximately 21% was sourced from coal, 43% from natural gas, 30% from other petroleum, and 6% came from renewable sources such as hydroelectricity, wind and biomass (see Figure 2).

*Figure 2: Oklahoma Energy Consumption by Fuel Source, 2010 (trillion Btu)*

![Bar chart showing energy consumption by fuel source in Oklahoma in 2010.](chart)


By sector, Oklahoma’s industrial sector is the heaviest energy user, consuming 551.3 trillion Btu in 2010, or approximately 36 percent of the state total. By comparison, the transportation sector consumed about 27%, the residential sector consumed approximately 21%, 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, 2010 (trillion Btu)*

![Pie chart showing energy consumption by end-use sector in Oklahoma in 2010.](chart)

Further analyzing residential consumption by heating source, 60% of Oklahoma homes are powered by natural gas, 26% are heated by electricity, and 11% of residents rely on liquefied petroleum gases for heat (see Figure 4).

**Figure 4: Oklahoma Home Heating Source, 2000**


**ELECTRICITY PROFILE**

Overall, Oklahoma’s electricity generation capacity and consumption trend toward national averages. Using the most recent data available, as shown in Table 1 below, the state’s electric power industry had a net summer generation capacity of 21,022 MW of electricity in 2010 and a net generation of 72,250,733 MWh, most of which comes from electric utilities, ranking the state 20th and 22nd in these respective categories as compared to other U.S. States. As a rough indication of demand, total retail sales were 57,845,980 MWh in 2008, accounting for approximately 80% of the total electricity generated. In this indicator of demand, Oklahoma ranks 25th in the nation—precisely at the national average. However one aspect of Oklahoma’s electric sector diverges from the state’s trend towards national averages. Electricity in Oklahoma is relatively inexpensive—in 2010 the average price of electricity per kWh was $0.0759, which ranks 41st in the United States.
Table 1: Oklahoma Electricity Summary Profile, 2010

<table>
<thead>
<tr>
<th>Item</th>
<th>Value</th>
<th>U.S. Rank</th>
</tr>
</thead>
<tbody>
<tr>
<td>Net Summer Capacity (megawatts)</td>
<td>21,022</td>
<td>20</td>
</tr>
<tr>
<td>Electric Utilities</td>
<td>16,015</td>
<td>18</td>
</tr>
<tr>
<td>Independent Power Producers &amp; Combined Heat and Power</td>
<td>5,006</td>
<td>17</td>
</tr>
<tr>
<td>Net Generation (megawatt hours)</td>
<td>72,250,733</td>
<td>22</td>
</tr>
<tr>
<td>Electric Utilities</td>
<td>57,421,195</td>
<td>17</td>
</tr>
<tr>
<td>Independent Power Producers &amp; Combined Heat and Power</td>
<td>14,829,538</td>
<td>24</td>
</tr>
<tr>
<td>Total Retail Sales (megawatt hours)</td>
<td>57,845,980</td>
<td>25</td>
</tr>
<tr>
<td>Full Service Provider Sales (megawatt hours)</td>
<td>57,875,980</td>
<td>23</td>
</tr>
<tr>
<td>Direct Use (megawatt hours)</td>
<td>1,077,701</td>
<td>23</td>
</tr>
<tr>
<td>Average Retail Price (cents/kWh)</td>
<td>7.59</td>
<td>41</td>
</tr>
</tbody>
</table>

KWh = Kilowatt hour.

In Oklahoma, coal- and natural gas-fired power plants dominate electric power production. The coal-fired facilities mainly receive their coal via railcar from Wyoming; those fueled by natural gas often source their fuel from within Oklahoma. It is only recently that natural gas has surpassed coal as the primary fuel source for electric generation in Oklahoma. Only a decade ago, coal powered 62.4% of electric generation, natural gas fueled only 31.5%, and renewables (excluding hydroelectricity) fueled not even half of one percent of the state’s electricity generation. However, as shown in Figure 5, as of 2010, natural gas powers 47% of kilowatt hours generated in Oklahoma, slightly exceeding the percentage of kilowatt hours generated from coal. The next highest source, renewable energy (excluding hydroelectricity), was responsible for fueling approximately 5.8% of the kilowatt hours generated in the state.
The state of Oklahoma has seven major electric generation suppliers operating in the state. Of these seven suppliers, 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. Three of these seven are investor-owned utilities (IOU), two are generation and transmission cooperatives, and two are public sector utilities.

**Electricity Providers in Oklahoma**

**Investor-Owned Utilities**
The three investor-owned 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
- 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 797,000 customers and can generate a capacity of approximately 6,800 megawatts. OG&E owns 7 power generation plants and 3 wind farms. This utility utilizes coal for 56% of its hours of generation, natural gas for 38% of its hours of generation,

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and wind for 6% of its hours of generation.\textsuperscript{7} OG&E’s electric transmission and distribution systems cover an area of 30,000 square miles\textsuperscript{8}. 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 AES-owned Shady Point generation facility near Poteau, Oklahoma, which generates electricity exclusively using Oklahoma coal.

Table 2: OG&E-Owned Generation Sources

<table>
<thead>
<tr>
<th>Facility Name</th>
<th>Location</th>
<th>Generating Capacity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Horseshoe Lake (gas)</td>
<td>Oklahoma City</td>
<td>857 MW</td>
</tr>
<tr>
<td>McClain (gas)</td>
<td>Newcastle</td>
<td>363 MW*</td>
</tr>
<tr>
<td>Muskogee (coal)</td>
<td>Muskogee</td>
<td>1,510 MW</td>
</tr>
<tr>
<td>Mustang (gas)</td>
<td>Oklahoma City</td>
<td>523 MW</td>
</tr>
<tr>
<td>Red Bud (gas)</td>
<td>Luther</td>
<td>601 MW*</td>
</tr>
<tr>
<td>Seminole (gas)</td>
<td>Seminole</td>
<td>1,500 MW</td>
</tr>
<tr>
<td>Sooner (coal)</td>
<td>Red Rock</td>
<td>1,038 MW</td>
</tr>
<tr>
<td>Centennial (wind)</td>
<td>Harper</td>
<td>120 MW</td>
</tr>
<tr>
<td>OU Spirit (wind)</td>
<td>Woodward</td>
<td>101 MW</td>
</tr>
<tr>
<td>Crossroads (wind)</td>
<td>Dewey</td>
<td>228 MW</td>
</tr>
</tbody>
</table>

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

\textsuperscript{7} 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.

Public Service Company of Oklahoma

Public Service Company of Oklahoma (PSO), which is a unit of American Electric Power, is the second-largest provider of electricity in Oklahoma, serving approximately 532,000 customers in the state. PSO has a wide-ranging service area, with customers in the eastern and southwestern areas of the state. PSO has a generation capacity of 4,254 megawatts within the state. PSO’s generation capacity by fuel mix includes 22.8% coal, 76.6% natural gas and 0.6% oil. PSO also purchases wind power under long-term contract. PSO has 3,582 miles of transmission lines and 22,027 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.


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Table 3: PSO-Owned Generation Facilities

<table>
<thead>
<tr>
<th>Facility Name</th>
<th>Location</th>
<th>Generating Capacity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tulsa Power Station (natural gas)</td>
<td>Tulsa</td>
<td>320 MW</td>
</tr>
<tr>
<td>Northeastern Station, Units 1&amp;2</td>
<td>Oologah</td>
<td>852 MW</td>
</tr>
<tr>
<td>(natural gas)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Northeastern Station, Units 3&amp;4</td>
<td>Oologah</td>
<td>930 MW</td>
</tr>
<tr>
<td>(coal)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Riverside (natural gas)</td>
<td>Jenks</td>
<td>1,052 MW</td>
</tr>
<tr>
<td>Comanche (natural gas)</td>
<td>Lawton</td>
<td>235 MW</td>
</tr>
<tr>
<td>Weleetka (natural gas)</td>
<td>Weleetka</td>
<td>156 MW</td>
</tr>
<tr>
<td>Southwestern Station (natural gas)</td>
<td>Anadarko</td>
<td>608 MW</td>
</tr>
<tr>
<td>Oklaunion (coal)</td>
<td>Vernon, TX</td>
<td>101 MW*</td>
</tr>
</tbody>
</table>

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

Figure 7: PSO Service Territory Map


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. The company provides service to 7,099 customers in three counties in the far northeastern Oklahoma counties of Craig, Delaware, and Ottawa.

EDE has an owned generation capacity of 1,392 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, 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 Facilities

<table>
<thead>
<tr>
<th>Facility Name</th>
<th>Location</th>
<th>Generation Capacity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Asbury (coal)</td>
<td>Asbury, MO</td>
<td>207 MW</td>
</tr>
<tr>
<td>Riverton (coal and gas)</td>
<td>Riverton, KS</td>
<td>279 MW</td>
</tr>
<tr>
<td>Iatan Units 1 &amp; 2 (coal)</td>
<td>Weston, MO</td>
<td>187 MW*</td>
</tr>
<tr>
<td>State Line Combined Cycle (gas)</td>
<td>Joplin, MO</td>
<td>297 MW*</td>
</tr>
<tr>
<td>State Line Unit 1 (gas)</td>
<td>Joplin, MO</td>
<td>94 MW</td>
</tr>
<tr>
<td>Energy Center (gas)</td>
<td>LaRussell, MO</td>
<td>267 MW</td>
</tr>
<tr>
<td>Ozark Beach (hydro)</td>
<td>Ozark Beach, MO</td>
<td>16 MW</td>
</tr>
<tr>
<td>Plum Point (coal)</td>
<td>Osceola, AR</td>
<td>50 MW*</td>
</tr>
</tbody>
</table>

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

Figure 8: Empire District Electric Company Service Territory Map


Cooperatives

Oklahoma is served by thirty electric cooperatives. The role of electric cooperatives in the state is a critical one, as combined they are the only utility entity that has infrastructure in and provides service to all 77 counties in Oklahoma. Together the cooperatives serve half a million customers, have more than

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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 (WFEC) and KAMO Power. These entities are comprised of individual member cooperatives. WFEC and KAMO Power are the predominant providers in Oklahoma. Golden Spread Electric Cooperative is based in Amarillo, Texas and serves only one Oklahoma distribution cooperative. Detailed membership lists for these two providers are contained as part of Appendix B.

**Western Farmers Electric Cooperative**
Western Farmers Electric Cooperative (WFEC), headquartered in Anadarko, Oklahoma, is the largest of the generation and transmission cooperative providers serving Oklahoma. WFEC is a consumer-owned, regional electric generation and transmission cooperative founded in 1941. It generates electric power from self-owned generation facilities and transmits that power to 19 distribution electric cooperatives whose service areas cover three-quarters of the state.\(^\text{11}\) Western Farmers’ member cooperatives operate in all but the northeastern portion of the state of Oklahoma and also serve over two-thirds of rural Oklahoma. WFEC owns and maintains more than 3,600 miles of transmission line and has over 1,700 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 Facilities\(^\text{12}\)**

<table>
<thead>
<tr>
<th>Facility Name</th>
<th>Location</th>
<th>Generation Capacity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hugo Plant (coal)</td>
<td>Fort Towson/Hugo</td>
<td>450 MW</td>
</tr>
<tr>
<td>Mooreland Plant (natural gas)</td>
<td>Mooreland</td>
<td>304 MW</td>
</tr>
<tr>
<td>Anadarko Plant (natural gas)</td>
<td>Anadarko</td>
<td>374 MW</td>
</tr>
</tbody>
</table>

---

\(^{11}\) WFEC also has 4 member cooperatives in New Mexico, bringing its total membership to 23.

KAMO Electric Cooperative

KAMO Electric Cooperative (KAMO Power), headquartered in Vinita, Oklahoma, is the second major generation and transmission cooperative provider serving Oklahoma. This cooperative is a consumer-owned generation and transmission rural electric cooperative serving customers in northeastern Oklahoma and southwestern Missouri. KAMO Power serves seventeen electric distribution cooperatives, eight of which are located in Oklahoma. It operates no generation facilities in Oklahoma; however, KAMO does own 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. (AECI), 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

<table>
<thead>
<tr>
<th>Facility Name</th>
<th>Location</th>
<th>Generation Capacity</th>
</tr>
</thead>
<tbody>
<tr>
<td>GRDA CFP 2 (coal)**</td>
<td>Chouteau</td>
<td>198 MW*</td>
</tr>
</tbody>
</table>

*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 AECI generation resources.
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. The Authority 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
- City of Blackwell
- City of Comanche
- Town of Copan
- City of Duncan
- City of Edmond
- Town of Eldorado
- City of Fairview
- City of Frederick
- City of Geary
- Town of Goltry
- City of Granite
- City of Hominy
- City of Kingfisher
- Town of Laverne
- City of Lexington
- City of Mangum
- Town of Manitou
- City of Marlow
- City of Newkirk
- Town of Okeene
- Town of Olustee
- Town of Orlando
- City of Pawhuska
- City of Perry
- City of Ponca City
- City of Pond Creek
- City of Prague
- City of Purcell
- Town of Ryan
- Town of Spiro
- City of Tecumseh
- City of Tonkawa
- City of Walters
- City of Waynoka
- City of Watonga
- City of Wetumka
- City of Wynnewood
- City of Yale
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

<table>
<thead>
<tr>
<th>Facility Name</th>
<th>Location</th>
<th>Generation Capacity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kaw Hydroelectric Plant (hydro)</td>
<td>Ponca City</td>
<td>29 MW</td>
</tr>
<tr>
<td>Oklaunion Power Station (coal)</td>
<td>Vernon, TX</td>
<td>80 MW*</td>
</tr>
<tr>
<td>McClain Plant (natural gas)</td>
<td>Newcastle</td>
<td>118 MW*</td>
</tr>
<tr>
<td>Red Bud Plant (natural gas)</td>
<td>Luther</td>
<td>158 MW*</td>
</tr>
<tr>
<td>Henry W. Pirkey Plant (lignite)</td>
<td>East Texas</td>
<td>15 MW*</td>
</tr>
<tr>
<td>Dolet Hills (lignite)</td>
<td>DeSoto Parish, LA</td>
<td>25 MW*</td>
</tr>
<tr>
<td>Ponca City Power Plant (natural gas)</td>
<td>Ponca City</td>
<td>104 MW</td>
</tr>
<tr>
<td>John W. Turk, Jr. Power Plant (coal)</td>
<td>Fulton, AR</td>
<td>40 MW*</td>
</tr>
</tbody>
</table>

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

Figure 11: OMPA Member Municipalities

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>
<thead>
<tr>
<th>Facility Name</th>
<th>Location</th>
<th>Generation Capacity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pensacola (hydro)</td>
<td>Langley</td>
<td>105 MW</td>
</tr>
<tr>
<td>Markham Ferry (hydro)</td>
<td>Locust Grove</td>
<td>108 MW</td>
</tr>
<tr>
<td>Salina Pumped Storage (hydro)</td>
<td>Salina</td>
<td>260 MW</td>
</tr>
<tr>
<td>GRDA CFP Unit 1 (coal)</td>
<td>Chouteau</td>
<td>490 MW</td>
</tr>
<tr>
<td>GRDA CFP Unit 2 (coal)</td>
<td>Chouteau</td>
<td>322 MW*</td>
</tr>
<tr>
<td>Redbud Gas Plant (natural gas)</td>
<td>Luther</td>
<td>443 MW*</td>
</tr>
</tbody>
</table>

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


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 sources. 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 2010, the total ratepayer-funded expenditures for electric (and gas) efficiency and load management programming were $22.5 million in Oklahoma.¹³ State- and local-administered programs also focus on energy efficient equipment and increasing the efficiency of public buildings.

Utility-Administered Programs
The state’s largest electric utility, Oklahoma Gas and Electric, has a goal to build no new generation until at least 2020. Therefore, OG&E currently manages eight efficiency and load management programs: Low Income Weatherization, Fixed Income Weatherization, Residential Home Energy Efficiency Program (HEEP), Positive Energy Home, Geothermal HVAC, Commercial Lighting, Standard Offer Program and Education.

PSO also operates a number of demand side management programs. Most recently, PSO has operated 17 programs, some of which include: Low Income Weatherization, Energy Star New Homes, Energy Star Multi-Family Residential Solutions, Energy Star Appliance, Residential AC Tune-up, Energy Audits, Commercial Energy Efficiency Programs, Business Energy Solutions, Commercial AC Tune-up, Model Cities, Smart Schools and a Demand Response Program.

The Empire District Electric Company currently offers three demand side management programs: an air conditioning unit tune up program; a high efficiency air conditioning unit rebate program; and a commercial and industrial rebate program for high-efficiency lighting, air conditioning, chiller, motors, and variable frequency drives.

Western Farmers Electric Cooperative and its member distribution cooperatives are attempting to use energy efficiency initiatives to minimize and/or delay building new generation necessitated by increased demand from oil and gas production activities in Oklahoma’s Mississippi Lime region. Western Farmers operates a rebate program for high efficiency HVAC systems including both air source and ground source heat pumps to reduce consumer demand during peaking conditions. Requirements for these equipment rebates have evolved overtime as the economics for both the cooperative and the consumer have become better understood. Because of Oklahoma’s extreme heat in summer months, Western Farmers has found that there is a significant difference in efficiency between air source equipment and ground source equipment during their peaking time frame and thus has modified their rebate program.

to reflect these findings, with special emphasis being placed on the renewable energy source provided by geothermal technology.

The Oklahoma Municipal Power Authority also offers a variety of programming in the efficiency and demand-side management area: 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 or weather stripping; and the DEEP program which provides matching funds to customers who implement energy-saving measures that will reduce their summer peak electric demands.

Together, in 2010, utility-operated demand-side management programs in Oklahoma conserved 133,973 MWh of electricity.\textsuperscript{14}

\textbf{State-Administered Programs}

At the state level, 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 percent 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.

\textbf{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 in place authorizing 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, authorized counties to create “County District Energy Authorities” that are authorized to issue notes/bonds, seek out public/private lenders, or apply for grants/loans from other governmental entities in order 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 property. These loans are then repaid on the owner’s property taxes and constitute a lien on the property until paid in full. At this writing, no counties are utilizing this mechanism.

Renewable Energy for Electricity

As mentioned previously in this document, as of 2010 Oklahoma sourced approximately 9.6% of its net electricity generated from renewable sources, mainly from hydroelectric and wind sources.\(^{15}\) 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 calls for 15% of the total installed generation capacity in Oklahoma to be derived from renewable sources by 2015. There are no interim targets, and the goal does not extend past 2015. Eligible renewable energy resources include wind, solar, hydropower, hydrogen, geothermal, biomass, and other renewable energy resources approved by the Oklahoma Corporation Commission (OCC). Energy efficiency may be used to meet up to 25% of the overall 15% renewable energy goal.\(^{16}\) As of the end of 2012, the state was on track to meet and even exceed this goal.

In 2012, Oklahoma ranked sixth in the nation for installed wind capacity, with more than 3,100 MW installed by the end of that year.\(^{17}\)

The state also relies on hydroelectricity to meet a portion of its electric demand. In 2010, hydroelectricity was used for nearly 3 million megawatt hours of generation in Oklahoma.\(^{18}\)

Oklahoma also has a growing use of geothermal energy for heating and cooling. For instance, OMPA offers the WISE geothermal rebate program for residential, commercial, or institutional applications, which in the past three years alone, has assisted with installation of 341 geothermal heat pumps, offsetting by (on average) half the kilowatts needed to power those customers’ homes or facilities. The program is available to any customer that receives electric service from an OMPA member city that participates in the WISE Rebate Program.

Western Farmers Electric Cooperative is also growing the use of geothermal energy by their distribution cooperative members. One cooperative member—Caddo Electric—has partnered with a third party provider and a residential developer to build ground source loops that will provide 100 percent geothermal energy in a 270-home development. The loops will be owned by the utility and provided as a utility service. Several other cooperative members are also considering the utilization of this model. In commercial settings, Western Farmers has partnered with an outside engineering firm to help cooperative members identify strategic facilities in their service areas, educate the commercial building


\(^{16}\) Database of State Incentives for Renewables and Efficiency, *Oklahoma Incentives/Policies for Renewables and Efficiency, Renewable Energy Goal*, http://www.dsireusa.org/incentives/incentive.cfm?Incentive_Code=OK05R&re=0&ee=0 (February 14, 2013).


owners, and then assist them step-by-step through the process of converting to ground source heating and cooling.

Within the public sector, geothermal energy is utilized as well. Oklahoma’s State Capitol Building is also the only Capitol building in the nation powered by geothermal energy—since the 1990’s, the building has relied on over 600 geothermal heat pumps to heat and cool the building.

PETROLEUM PROFILE
Oklahoma produces a substantial amount of oil, with annual production typically accounting for more than 3% of total U.S. production in recent years. Currently, Oklahoma ranks 5th in crude oil production nationally. Crude oil wells and gathering pipeline systems are concentrated in central Oklahoma, although drilling activity also takes place in the Panhandle. Two of the 100 largest oil fields in the United States are found in Oklahoma.

Crude Oil Producers in Oklahoma
There are over 3,000 producers of oil in Oklahoma, but the top 10 producers by volume for 2011 are shown in Table 9.

<table>
<thead>
<tr>
<th>Producer</th>
<th>Oil (barrels)</th>
<th>Percentage of Total 2011 Oklahoma Oil Production</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chesapeake Operating Incorporated</td>
<td>8,688,340</td>
<td>11.31 %</td>
</tr>
<tr>
<td>Chaparral Energy Limited Liability</td>
<td>4,116,420</td>
<td>5.36 %</td>
</tr>
<tr>
<td>Citation Oil &amp; Gas Corporation</td>
<td>3,789,529</td>
<td>4.93 %</td>
</tr>
<tr>
<td>Sheridan Production Company LLC</td>
<td>2,220,378</td>
<td>2.89 %</td>
</tr>
<tr>
<td>Linn Operating, Inc.</td>
<td>1,996,767</td>
<td>2.60 %</td>
</tr>
<tr>
<td>Apache Corporation</td>
<td>1,351,017</td>
<td>1.76 %</td>
</tr>
<tr>
<td>SandRidge Exploration and Production</td>
<td>1,280,883</td>
<td>1.67 %</td>
</tr>
<tr>
<td>Merit Energy Company</td>
<td>1,097,947</td>
<td>1.43 %</td>
</tr>
<tr>
<td>Mack Energy Company</td>
<td>923,383</td>
<td>1.20 %</td>
</tr>
<tr>
<td>Xto Energy Incorporated</td>
<td>897,619</td>
<td>1.17 %</td>
</tr>
</tbody>
</table>

The City of Cushing, in central Oklahoma, is a major crude oil trading hub that connects Gulf Coast refiners to producers both in the United States and Canada. In addition to Oklahoma crude oil, the Cushing hub receives supply from several major pipelines that originate in Texas. On any given day, approximately 75 percent of U.S. crude oil passes through the Cushing Hub. 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 rapidly expanding 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 just under 500,000 barrels/calendar day—roughly 3% of the total U.S. refining capacity. Table 10 lists these refineries, the largest of which is the Ponca City Refinery that is owned and operated by ConocoPhilips.

<table>
<thead>
<tr>
<th>Company</th>
<th>Refinery Name</th>
<th>Location</th>
<th>Capacity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Valero</td>
<td>Ardmore Refinery</td>
<td>Ardmore</td>
<td>85,000 bbl/d</td>
</tr>
<tr>
<td>CVR Energy</td>
<td>Wynnewood Refinery</td>
<td>Wynnewood</td>
<td>70,000 bbl/d</td>
</tr>
<tr>
<td>Ventura Refining &amp;</td>
<td>Thomas Refinery</td>
<td>Thomas</td>
<td>12,000 bbl/d</td>
</tr>
<tr>
<td>Transmission</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ConocoPhilips</td>
<td>Ponca City Refinery</td>
<td>Ponca City</td>
<td>198,400 bbl/d</td>
</tr>
<tr>
<td>HollyFrontier Corporation</td>
<td>Tulsa Refinery (East)</td>
<td>Tulsa</td>
<td>125,000 bbl/d</td>
</tr>
</tbody>
</table>

Table 10: Oil Refineries in Oklahoma


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 produces on average about 204,000 barrels per day of crude oil\(^{21}\) by way of nearly 200 rotary rigs that are currently drilling for oil and gas and 83,621 crude oil producing wells (15.9% of U.S. total wells)\(^{22}\). Figure 13 visually summarizes the history of oil production in Oklahoma. As indicated, the amount of overall crude oil produced per day has significantly decreased in the last 20-30 years, but since 2010, production has once again been increasing, to levels not seen since the mid-1990s.\(^ {23}\) This phenomenon is due to new oil extraction techniques that can extract unconventional oil from tight shale rock formations. In terms of future production, Oklahoma had 710 million barrels of proven reserves at the end of 2010, accounting for 3 percent of all U.S. reserves.


\(^{22}\) U.S. Energy Information Administration,  Oklahoma Profile Data, Reserves and Supply, \url{http://www.eia.gov/beta/state/data.cfm?sid=OK#ReservesSupply} (February 14, 2013).

With regard to the prices of petroleum in Oklahoma, the average price of first use domestic crude was $90.54/barrel in September 2012, as compared to the national average of $95.98/barrel.\(^\text{24}\) In addition to crude being less 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 January 1983 to February 2011, which, over time, trended approximately 4 to 5 cents less expensive than the national average. The figure also demonstrates the relative volatility in gasoline prices, especially since 2008.

\(^\text{24}\) 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](http://www.eia.gov/dnav/pet/pet_pri_dfp1_k_m.htm) (February 14, 2013).
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 OCC\(^{25}\) and the Department of Environmental Quality (DEQ) provide regulatory oversight. A complete discussion of the regulatory activities conducted by the OCC’s Oil and Gas Conservation Division regulates oil well sites in the state, utilizing a headquarters in Oklahoma City and four regional offices to conduct administrative and on-site activities. A 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 response actions in the event of a spill, explosion, or other well site emergency. To ensure that Oklahoma regulations are adequate and updated, the OCC’s Oil and Gas Conservation Division participates in regional and national organizations. First, the Division is a member of and actively participates 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 own regulations and share best practices. OCC is also a member of the Groundwater Protection Council.

Once oil leaves the drilling site, the OCC’s Transportation Division, which includes the Pipeline Safety Office, 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.

\(^{25}\) Resulting from Oklahoma’s Native American history, production from some tribal lands falls under the regulation of the Bureau of Indian Affairs.
Additionally the Oklahoma Marginal Well Commission supports technology transfer to ensure that wells can remain in production as long as possible.

The Oklahoma Department of Environmental Quality regulates oil refinery sites, primarily from an air and water quality standpoint.

Once crude oil is refined and processed into motor vehicle fuel, OCC once again assumes regulatory authority, for the storage of this motor vehicle fuel onsite 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.

At the federal level, the U.S. EPA is also involved in regulating various aspects of the oil industry in Oklahoma, both chemical storage at well sites and inspection of storage tanks. A complete discussion of U.S. EPA authority in assuring 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 gross production. Half of this fund is used for the restoration of abandoned well sites.

**Industry Stakeholders**
There are a number of oil and petroleum trade associations active in Oklahoma. Among the largest are the Oklahoma Petroleum Marketers Council, 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. More than a dozen of the 100 largest natural gas fields in the country are found in the state, and proven reserves of conventional natural gas have been increasing in recent years. Likewise, Oklahoma has large reserves of coalbed methane in the Arkoma Basin and the Cherokee Platform in the eastern part of the state, and extraction of those resources has grown in recent years. With this in mind, it is essential to remember that Oklahoma’s natural gas production is critical not only for state consumption, but for 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, including the natural gas trading hubs in Texas and Kansas. In addition to supplying neighboring states, Oklahoma imports a significant quantity of natural gas. Almost 90 percent of 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 2010, the wellhead price was $4.71/thousand cubic feet, compared to a national average of $4.48. By comparison the city gate price in Oklahoma was $6.18 versus a national average of $6.10. Finally, the residential price was $11.13 compared to an average of $11.39 across the rest of the country. With regard to the future production of natural gas, Oklahoma had 26,345 billion cu. ft. of dry natural gas and 1,270 million barrels of natural gas plant liquids in known reserves in 2010. Additionally, as of August 2012, Oklahoma has 352,013 million cu. ft. of natural gas in underground storage.26

In terms of production and supply, in 2011 Oklahoma had 65,000 drilled (not plugged) natural gas wells, approximately 40,000 of which are in operation at any given month. In the same year, the state produced 1,827,328 million cubic feet (Mcf) of gas.27 There are well over 75 producers of natural gas in Oklahoma, but the top 10 producers by volume for 2011 are listed in Table 11.

Table 11: Top Oklahoma Natural Gas Producers by Volume, 2011

<table>
<thead>
<tr>
<th>Producer</th>
<th>Natural Gas Produced (Mcf)</th>
<th>Percentage of Total 2011 Oklahoma Natural Gas Production</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chesapeake Operating Incorporated</td>
<td>233,913,760</td>
<td>15.10 %</td>
</tr>
<tr>
<td>BP America Production Company</td>
<td>108,869,353</td>
<td>7.03 %</td>
</tr>
<tr>
<td>Newfield Mid-Continent Exploration, Inc.</td>
<td>106,815,721</td>
<td>6.89 %</td>
</tr>
<tr>
<td>Devon Energy Production Company L P</td>
<td>79,515,822</td>
<td>5.13 %</td>
</tr>
<tr>
<td>Xto Energy Incorporated</td>
<td>70,879,053</td>
<td>4.57 %</td>
</tr>
<tr>
<td>Apache Corporation</td>
<td>59,004,580</td>
<td>3.81 %</td>
</tr>
<tr>
<td>Cimarex Energy Company</td>
<td>39,325,569</td>
<td>2.54 %</td>
</tr>
<tr>
<td>St. Mary Land &amp; Exploration Company</td>
<td>38,772,830</td>
<td>2.50 %</td>
</tr>
<tr>
<td>Kaiser-Francis Oil Company</td>
<td>36,741,321</td>
<td>2.37 %</td>
</tr>
<tr>
<td>Burlington Resources O&amp;G Co. L P</td>
<td>29,221,773</td>
<td>1.89 %</td>
</tr>
</tbody>
</table>


As listed in Figure 15, the amount of natural gas that Oklahoma produces has varied a bit in the last 40 years. Marketed production was at its highest in the late 1980s through the early 1990s. However, the last several years have witnessed yet another rise in production.

![Figure 15: Natural Gas Production in Oklahoma, 1906-2011](image)


**Natural Gas Providers in Oklahoma**

**Natural Gas Utilities**
The six natural gas companies that provide retail service to most of the state, and which are regulated by the State, are:

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

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

**Oklahoma Natural Gas Company**
Oklahoma Natural Gas Company is a division of Tulsa-based ONEOK, Inc. ONEOK 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 840,000 residential, commercial and industrial customers and maintains 18,100 miles of distribution mains and services in the state. Oklahoma Natural Gas affiliates also operate transmission and storage in the state that include more than 2,500 miles of pipeline and five strategically-located underground storage facilities. Figure 16 displays the Oklahoma Natural Gas service territory.

*Figure 16: Oklahoma Natural Gas Company Service Territory Map*


**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 pipeline in Oklahoma and 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 only 18 cities in Oklahoma with 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.
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 13,534 Oklahoma 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 should be 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.

*Cities and towns served with 1,000 customers or greater
Inter- and Intrastate Transportation of Natural Gas

The majority of natural gas is transported via the complex web of pipelines listed 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 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

However, the Oklahoma Corporation Commission’s (OCC) Pipeline Safety Division administers an intrastate pipeline regulatory program to assure the safe transportation of natural gas by pipeline. The Commission develops regulations and other approaches to assure safety in design, construction, testing, operation, maintenance, and emergency response to pipeline facilities. The Commission derives its
authority over *intrastate* pipeline operations through state statutes and certification agreements with the U.S. Department of Transportation. The OCC's safety jurisdiction over pipelines covers more than 240 intrastate gathering, transmission, and distribution operators and 16 *intrastate* hazardous liquid operators.

Within Oklahoma, there are several major intrastate pipeline networks. First, as shown in Figure 19, Enogex, an affiliate of the public utility Oklahoma Gas & Electric (OG&E), operates a pipeline network that gathers, processes, transports and stores natural gas throughout the state. The network is composed of approximately 8,000 miles of pipe, nine processing plants, and 24 billion cubic feet of storage capacity.

*Figure 19: Enogex Pipeline Network*

![Enogex Pipeline Network](image)

ONEOK, the parent company of Oklahoma Natural Gas, also 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. As mentioned above, 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.
Interstate Natural Gas Pipeline Companies

- 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 serving 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
Both of 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 both residential and commercial efficiency rebates on these items. Smaller providers in Oklahoma also offer a variety of programs.

Compressed Natural Gas for Transportation
In 2010, Oklahoma had 10,493 alternative fuel vehicles on the road in the state. These vehicles were fueled by compressed natural gas (CNG), electricity, ethanol (E85), or liquefied petroleum gas. Together these vehicles utilize nearly 4 million gallons of alternative fuel annually.\(^{28}\) Moving forward, Oklahoma is aggressively pursuing 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 which will lower the cost premium for the State or municipalities to purchase CNG vehicles.

Oklahoma is also developing the fueling infrastructure to support the increasing number of CNG vehicles in the state. As of October 2012, Oklahoma had 69 public CNG fueling stations with another 9 stations in the planning phase. Complete location and contact information for these stations can be found in Appendix C. In addition, the U.S. Department of Energy’s website offers a station locator that can search 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.

COAL PROFILE
Oklahoma has a modest amount of coal deposits in the state; these account for 0.5 percent of the U.S. reserves and 0.1 percent of annual national production. Even so, Oklahoma was ranked 8th in the nation for coal production in 2010. By 2011, there were six operating coal mines producing approximately 1.1 million tons of coal in five counties in Oklahoma. Coal is the fuel source for approximately 40 percent of the electricity generation in the state. The coal utilized for electricity generation in Oklahoma is primarily from Wyoming and delivered by railcar. However, AES Shady Point, a co-generation facility near Poteau, burns 100 percent Oklahoma coal, and sells the generation to OG&E. The potential does exist for increased capacity from the coal mines in the state, which, as shown in Figure 22, are located in the northeast corner of the state, and with proper federal and state waivers in place, coal could have a 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.

32 Craig, Haskell, Le Flore, Nowata, and Okmulgee counties.
Figure 22: Oklahoma Coal Production Map


Five companies operate coal mines in Oklahoma. These are:

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

PROPANE PROFILE

The State of Oklahoma does not regulate propane dealers. Rather, the Oklahoma LP Gas Administration regulates the propane industry. The LP Gas Administration (a.k.a. the LP Gas Research, Marketing and Safety Commission), was created by the Oklahoma Legislature in 1994 to serve Oklahoma’s propane industry and the thousands of propane customers. Its Commissioners are industry representatives. It is important to note that over the last several years, the Oklahoma Legislature has proposed rolling the LP Gas Administration and its functions into the Corporation Commission, but the bill has not yet passed.

Propane is the primary heating source in 11 percent of the homes in Oklahoma. This is nearly twice as much as the national average for home heating. This is largely due to the rural nature of much of Oklahoma that 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:

<table>
<thead>
<tr>
<th>Conoco</th>
<th>Koch</th>
<th>Phillips</th>
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<tbody>
<tr>
<td>DSE</td>
<td>PDIM</td>
<td>Trans Texas</td>
</tr>
<tr>
<td>Exxon</td>
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</table>

The National Propane Gas Association (NPGA) 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 transporters.
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
To better understand and plan for likely emergency scenarios, a comprehensive history of Oklahoma’s energy emergencies was compiled by the University of Oklahoma’s Center for Risk and Crisis Management, which conducted a media analysis of reported energy incidents that occurred between January 2000 and May 2010. Oklahoma’s two major newspapers—the Tulsa World and the Daily Oklahoman—were used. In all, 203 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 more than 64% of the 203 events. Oil and natural gas incidents accounted for 13% and 15% of the emergency events, respectively. Lastly, other incidents, which relate to such energy sources as propane gas, accounted for roughly 8% of the incidents that were documented in the media analysis.

Figure 22: Number of Oklahoma Energy Incidents, by Sector, 2000-2010
Figure 23 provides a brief look at the cause for each of the 203 energy incidents. When looking at the oil, natural gas, and other sectors, most of the incidents were caused by accidents or technical failures. By comparison, the vast majority of incidents within the electricity sector were caused by natural disasters.

*Figure 23: Number of Oklahoma Energy Incidents, by Sector and Cause, 2000-2010*

Next, Figure 24 breaks out each of these events by month. The analysis shows that the majority of natural gas incidents have occurred in July and December. Similarly, most of the oil incidents happened in December and April. In contrast, the majority of electricity events occurred during the summer (May-August) or during the winter (November-January), perhaps reflecting patterns in the weather. By contrast, there appears to be no seasonal pattern in the occurrence of other incidents.
Finally, Figure 25 displays the scope of each energy incident by sector. These data reveal a distinctive pattern—natural gas, oil, and other incidents tend to be localized 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. Department of Energy reports\(^ {35} \) indicated 18 electric events affecting Oklahoma over a ten year period rose to the standard of required federal reporting. Under any of the following circumstances, an electric provider must file a report:

- Physical attack that causes major interruptions or impacts to critical infrastructure facilities or operations
- Cyber event that causes interruptions of electrical system operations

• Complete operational failure or shut-down of the transmission and/or distribution electrical system
• Electrical System Separation (Islanding) where part/parts of a power grid remain operational in an otherwise blacked out area of within the partial failure of an integrated electrical system
• Uncontrolled loss of 300 Megawatts or more of firm system loads for more than 15 minutes from a single incident
• Load shedding of 100 Megawatts or more implemented under emergency operational policy
• System-wide voltage reductions of 3 percent 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 1 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 Scope, 2000-2010
Infrastructure Vulnerabilities by Energy Source

Protecting the state’s critical energy infrastructure can be key in preventing at least some energy emergencies, and to protect this infrastructure, an understanding of its inherent vulnerabilities is also key.

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. Threats to electric infrastructure might include:

- **Deliberate attacks** on the electrical system, which could come in many forms. Almost all electricity infrastructure represents potential targets. Some attacks, such as terrorist actions, may be with the intention 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. In particular, hard-to-replace components of the electric grid such as the custom-built transformers that increase the voltage of electricity to levels suited for bulk transmission and then reduce voltage for distribution to customers are vulnerable. Very few of those transformers are manufactured in the United States, and replacing them can take many months.\(^3\) Furthermore, as the electric grid becomes increasingly automated, the power grid 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 tornados that routinely occur throughout the state. Other threats include floods (often exacerbated by 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 supply disruption to the common feedstocks for electric generation (natural gas or coal) have the potential to disrupt electric providers’ ability to meet consumer demand. Further, aging infrastructure can fail, potentially resulting in widespread or prolonged outages.

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 self-identify their most vulnerable infrastructure and equipment. The list and location of this infrastructure is kept confidential by the operators but the analysis is complete and on-hand in case of need. Potential threats to this identified infrastructure might include:

- **Deliberate attacks**, which could be realized to many portions of natural gas production facilities. Most of the wellheads are in remote areas and are largely unsecured. It is not uncommon for accidents to occur and rupture these wellheads. In addition, intentional damage by either terrorists or vandals could occur. A similar potential exists for the pipeline, processing facilities, pump stations, and ultimately the gas meters. All are potential targets for accident or intentional attacks.

- **Natural disasters**, which are highly probable events in the state. Oklahoma is regularly impacted by high winds, wildfires, tornados, and lightning, which could 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, the region is modestly seismically active, 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 construction digging. According to the U. S. Department of Transportation, Pipeline and Hazardous Materials Safety Administration (PHMSA), there are currently 13,188 miles of natural gas transmission lines, 1,043 miles of gathering lines, and 24,607 miles of gas distribution lines in Oklahoma, and although this abundance of infrastructure makes supply far-reaching and reliable, it also increases the potential for accidents to occur.

- **Systemic** threats, which include pipeline corrosion due to aging infrastructure or overall demand increases due to favorable pricing or newly developed end uses for natural gas.
**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 percent of nation’s crude oil passes through this junction, supplying significant amounts of oil to the eastern and midwestern portions of the United States. In addition to acting as a supply hub, Cushing is surrounded by several tank farms (see Figure 26), most of which 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 46.3 million barrels of oil at a time. The major pipelines that supply Cushing include Spearhead (90,000 bbl/d), Pegasus (96,000 bbl/d), and Keystone (591,000 bbl/d).

- **Deliberate attacks** could threaten all types of critical petroleum infrastructure. Oil production rigs, storage facilities, pipelines, and refineries are all vulnerable to deliberate attacks. First, crude oil is often stored in above ground tanks, both at the production sites, tank farms, and refineries. In some cases, these 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 asset protection requirement—additional protection measures are at the company’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 disposal sites, such as gates, and cities can set more stringent measures if they choose for sites located within urban areas. In addition, according to the U. S. Department of Transportation, Pipeline and Hazardous Materials Safety Administration (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. High winds and tornadic events could damage production and refinery operations, lightning could strike infrastructure like storage tanks, leading to supply shortages, and seismic activity could potentially damage infrastructure.

- **Accidents** are potential risks, particularly for production and pipelines. In particular, accidental pipeline rupture due to unrelated construction digging can be common.

- **Systemic** threats, such as the inability to increase crude oil production beyond the current reserves. Additionally, refining capacity may be unable to increase production to support anticipated increased future demands.
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 SmartGrid in the electric sector and remote meter reading, service connections, and cutoffs in the natural gas industry allow utilities to increase speed of response, allow more customer choice, and, once installed, reduce costs.

However, these “smarter” 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 the past year alone, the number of reported cyber attacks on computers used to run power generation facilities, natural gas pipelines and the electric grid more than doubled to 82 reported attacks, up from 31 in 2011. Consequently, cyber security 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. However, 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 legislation related to cybersecurity. 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 final Framework will be completed in 2014. The Executive Order also created a Voluntary Critical Infrastructure Cybersecurity Program for utilities, transportation and telecommunications firms to adopt the cybersecurity standards outlined in the Cybersecurity Framework. It is important to note that these federal agencies will also be considering incentives for owners of critical infrastructure to participate in adopting the standards outlined in the Framework.

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As standards and regulations continue to develop, the U.S. Department of Energy has worked with electric utilities in particular to create an Electricity Subsector Cybersecurity Capability Maturity Model (ES-C2M2)\textsuperscript{39}, 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 Department of Energy in partnership with the Department of Homeland Security (DHS) and involved close collaboration with industry, other Federal agencies, and other stakeholders, including CenterPoint Energy.

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) Guideline\textsuperscript{40}, 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 Cybersecurity\textsuperscript{41}, 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 Regulators\textsuperscript{42}, and the NARUC Critical Infrastructure Committee cybersecurity resolution\textsuperscript{43}.

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.


\textsuperscript{43} 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 of the resolution can be found at http://www.naruc.org/Resolutions/Resolution20on%20Cybersecurity1.pdf.
Cybersecurity Measures in the Electric Sector

Oklahoma Gas & Electric Company

Oklahoma Gas & Electric (OG&E), the state’s largest electric utility, has an overall cybersecurity plan in place which is layered and based on industry standards (NERC CIP, NIST, 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 that 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 threat conditions, including working with the U.S. Department of Energy, and perform threat and vulnerability analyses to evaluate different standards and select the appropriate controls.

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 to ensure 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 3rd 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, facilities, and the availability of people to run its critical systems. Additionally, OG&E has Privacy and Confidentiality policies and practices associated with the exfiltration of sensitive information including data that has been designated as protected customer information.

Public Service Company of Oklahoma

Public Service Company of Oklahoma (PSO), which is a division of the national corporation 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 utilize a layered approach to security. AEP maintains a dynamic cybersecurity testing program which tests systems against cyber threats. AEP also emphasizes company-wide staff training with annually required cybersecurity training for all employees as well as quarterly events on timely topics. The company
reviews it policies and procedures to ensure that they are up to date and protect its assets against ever-evolving threats.

AEP approaches cybersecurity from both 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 design 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 proactive analysis of malcode to reduce the risk of threats 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 contributes as a member of a cybersecurity consortium consisting of 6 major utilities that working 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 the cyber incident.

**Western Farmers Electric Cooperative**

Cooperative electric providers are also emphasizing cybersecurity protocols. At Western Farmers Electric Cooperative (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, the cooperative has initiated an information protection program, which identifies, marks, and stores separately that information classified as sensitive and confidential. Access is limited, and any employee with access receives 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 ensure reliability of service for its member customers.

**Grand River Dam Authority**

Finally, publicly-owned utilities are also making investments in cybersecurity. The Grand River Dam Authority 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 completes 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, always 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 our responses to problems when 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 always 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 ensure the utility can incorporate industry reliability and security best practices as they develop.

**Cybersecurity Measures in the Natural Gas Sector**

**Oklahoma Natural Gas Company**

On the natural gas side, Oklahoma Natural Gas Company (ONG), a division of ONEOK, 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.

ONEOK 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 ONG 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, ONG has conducted risk assessments on its electronic assets and, if 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, ONG 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 was needed, ONEOK is required to follow all applicable reporting regulations. For example, if the breach involves a loss of Personally Identifiable Information (PII), ONEOK would be obligated to comply with all applicable state 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, ONEOK 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. ONEOK currently has processes in place to recover from breach scenarios involving either PII or control systems.

**CenterPoint Energy**

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 to ensure protection against attack, and continuity of service should a cyber attack occur.

The development of CenterPoint’s practices involved extensive 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. Department of Energy has reviewed and approved CenterPoint’s cybersecurity strategy.

Since cyber security threats are constantly changing and evolving, CenterPoint 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’s system, and a 2013 annual exercise has been scheduled to test CenterPoint’s readiness; the exercise will be based on threat scenarios developed in conjunction with industry and governmental groups.

CenterPoint places a particular emphasis on staff training as a deterrent to cyber incidents. 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 has detailed response plans in place. If the event involves a service interruption, the utility will utilize its operational response plans, which include communications between local, state and federal jurisdictions, to restore service. This includes notification to the Department of Homeland Security, Department of Energy, Transportation Security Administration, American Gas Association, Interstate Natural Gas Association of America, and Edison Electric Institute.
If computer systems were compromised, the utility has the capability to operate its system manually until electronic systems are restored. In addition, if customer data were 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 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 the recovery of the computer systems. The computer systems restoration would involve a restore from CenterPoint’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 as an official advisory group to the Federal Communications Commission. The cybersecurity working group within the CSRIC has produced a nearly 150 page manual of best practices to plan for and respond to cybersecurity events. In fact, AT&T and Cox Communications served as co-chairs of this working group.

The CSRIC was established as a Federal Advisory Committee designed to provide recommendations to the Federal Communications Commission (FCC) regarding best practices and actions the Commission can take to ensure optimal security, reliability, and interoperability of communications systems, including telecommunications, media and public safety communications systems. In drafting their 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.


**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 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).\footnote{U.S. Department of Homeland Security. \textit{Government Emergency Telecommunications Service}. \url{http://gets.ncs.gov/program_info.html} (April 9, 2013).} Participation in this service will help utilities maintain communications channels in the event of 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 the Regional Transmission Organizations (RTOs) have been developing transmission systems that are cost-shared throughout the states in the region. In the case of Oklahoma this function is performed by the Southwest Power Pool. Increasingly the transmission functions of the member utilities are directed by an RTO or an Independent System Operator (ISO). The RTO concept is under the supervisory authority of the Federal Energy Regulatory Commission (FERC). The RTO sets the cybersecurity protocol for the multi-state transmission system under FERC supervision.

Today, RTOs are creating a region-wide generation economic dispatch system. Here the individual electric utilities inform the RTO what their expected load will be for the next day and what generating facilities the utility has available. The RTO will then dispatch the various generating units on the basis of what is economically most favorable to meet the load of the entire region and set a market clearing price that the utility will be charged for electricity received as well as paid for electricity generated. This would include the use of renewable sources of energy entering the electric system, such as wind, solar and hydroelectric power. Here again the cyber security of the system will be handed by the RTO 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 between 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, it is wise to plan for scenarios in which energy shortages or emergencies impact other vital industries critical to restoration of normal conditions. A few of these scenarios are outlined below.

Downstream consequences of an electrical disruption may include:

- Failure of petroleum supply infrastructure to function when electric power is interrupted
• Outages at refineries and gas processing plants due to electric outages
• Outages of natural gas appliances as restoration of electrical service triggers pilot lights simultaneously and de-pressurizes gas lines
• Failure of water supply and purification systems to operate when power is lost
• Secondary utility system time-to-failure when back-up storage is exhausted
• 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 state residents due to extreme heat and cold temperatures commonly occurring in the state
• Failure of retail gas companies to pump gas, as they are dependent upon electricity for pump function

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

First, certain changes to infrastructure that is reliant on electric power would reduce the kind of mutual dependencies that result in wider 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 control. Similarly, small generators could be placed in areas where power is needed for pumping water, as many rural Oklahoma customers utilize 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 therefore gasoline pump failure—large battery-powered generators can be quickly delivered to these sites in order to ensure fuel availability for emergency responders and critical needs. During restoration efforts, electric utilities should work collaboratively with natural gas providers to cooperatively bring small sections of electric customers back online so that gas lines are not suddenly de-pressurized as electric-start pilot lights on furnaces all re-light simultaneously.45

To prevent failure of land line telecommunication systems, providers rely on back-up batteries located at their central offices. These batteries are periodically charged by mobile generators housed on flat bed 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 re-charged using mobile generators. In addition, larger cellular providers offer Cellular on Wheels, a vehicle-mounted cellular tower that can be moved from location to location as needed. For longer-term outage situations, fuel-based generators

45 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 ONEOK and OG&E—during restoration efforts, ONEOK 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.
can be installed but it is unknown today how widely these are utilized by telecommunications providers in Oklahoma.46

Finally, the natural gas system is equipped with pumps that run on natural gas instead of electricity so that the system can survive an extended blackout.

Downstream consequences of a natural gas disruption may include:

- Loss of electricity generation in the state and other regions as well
- Loss of a primary home heating source in the state (60% of homes) and in other regions
- Loss of fuel source for Compressed Natural Gas (CNG) vehicles, an increasing component of municipal and state fleets as well as private fleets.

To reduce downstream consequences from natural gas incidents such as the ones outlined above, Oklahoma utilities should ensure a feedstock mix in their generation capacity—in practice, this diversification is already increasing as the reliance on energy sources such as wind power grows. Similarly, diversification of fuel sources, including gasoline and electricity, for public sector fleet vehicles will ensure the capability of state and local governments to continue to respond in emergency situations.

Downstream consequences of a petroleum 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 disruptions, states should encourage diversity in fuel sources for the transportation sector, perhaps exploring compressed natural gas or biodiesel

46 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 (FCC) 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.
opportunities for the trucking industry, so that in 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 (ESF-12-Energy) under the National Response Framework (NRF) delineates the relevant actors and their responsibilities.\(^4\) In the state of Oklahoma, these responsibilities are spelled out in the Energy Annex (ESF-12) of the Oklahoma Emergency Operations Plan.

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](image)

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 Emergency Operations Plan (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 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.

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 on behalf of the Governor when coordinating (as necessary) 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 the 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 (ESF-12) and represented in Figure 27, the Oklahoma Corporation Commission (OCC), which is responsible for regulating public service companies, 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 will become 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. Not only does OCC regulate public service companies in the electric and natural gas industries as well as pipeline safety, oil and gas, but also a variety of other industries that are interdependent on these industries, such as telecommunications and trucking. Because of this wide purview and therefore deep relationship base, 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 Commission has a permanent seat at the table within the Emergency Operations Center, from where 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). In the event that outages go unreported by the energy companies, 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 ESF-12 of the Oklahoma EOP):

- Upon request by OEM, provide an agency representative (agency coordination officer) to the State EOC, who will 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 in restoring 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 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 additional assistance is required by the utilities, the coordinator will work through the supporting groups for additional information and requirements.

Additional responsibilities include safety inspections of rail crossings, investigation of derailments of trains carrying hazardous materials, pipeline safety for natural gas as well as hazardous materials, providing technical assistance and inspections of petroleum pollution; safety inspections of above and underground fuel storage tanks.

**Phase IV: Review Lessons Learned**

During Phase IV, which involves 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 their 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 Military Department
- Oklahoma Office of Homeland Security (OKOHS)
- 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 follow:

- **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 (i.e., 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 (i.e., 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. Additionally, the LP Gas Administration will assist with rerouting and redistribution of LP gas resources as requested.

• The Oklahoma Military Department, when requested, will utilize 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 regulatory floodplains in the 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 ESF-12 responsibilities, yet still a vital component, many other social service agencies hold responsibilities for response during energy emergencies. If the energy emergency requires sheltering for victims, many nonprofit and faith-based organizations offer feeding and shelter. In times of need, Oklahoma Emergency Management coordinates with Oklahoma Voluntary
Organizations Active in Disasters (OKVOAD), 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. OKVOAD agencies are The American Red Cross, The Salvation Army, Food banks, volunteer centers and most of the faith-based groups who have disaster work 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 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. Department of Energy is the lead federal agency when Department of Homeland Security DHS/FEMA activates ESF-12 in the National Response Framework at the federal level. As specified in ESF-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.

Likewise, DOE maintains the following capabilities in order to meet ESF requirements:

- Collects and reports to Congress information filed by electric energy generators, transmitters and distributors on 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 publicly-owned electric, gas, and lifeline utilities 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

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• 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 E-mail at hqdoe@oem.doe.gov.

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

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

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 National Oceanic and Atmospheric Administration (NOAA) are part of DOC. MMS oversees the oil and gas production fields in the Gulf of Mexico, and NOAA provides up-to-the-minute tracking for 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 sub-agencies 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 ESF-12 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**

All 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 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 both 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**

The 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 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 this information 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 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, the vast majority of information about energy disruptions and emergencies is reported to state officials by energy companies and local emergency managers. 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 Restoration of Service (Electric) /165:45-9-2.1 (Gas)) to provide Restoration of Service plans annually to the Director of the Corporation Commission’s Consumer Services Division; these 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 each company’s plan is received, the Public Information Manager of the Corporation Commission 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 Manager is responsible for contacting any 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 2 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 OCC receives information about any energy the agency is responsible for relaying the appropriate information about outages or pipeline incidents to 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 Red Cross. 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 OEM) is responsible for communication with the federal government.

In addition, Oklahoma has five individuals who serve as Energy Emergency Assurance Coordinators—these individuals, who each have planning and response responsibilities during energy emergencies—are registered on a password-protected ISERnet 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 OEM or other key state decision makers. These five individuals include the Deputy Director of Emergency Management, the Public Information Manager 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.

In order to ensure the continued flow of information, the Commission’s Public Information Manager 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 Manager, when appropriate, will provide updates to the media (print, television and radio) 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 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 Manager/Liaison to 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 in order to ensure that the content is accurate.

In order 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, utilities in Oklahoma have registered to use the Government Emergency Telecommunications Service (GETS). As of this writing, AEP-PSO, CenterPoint, ONEOK (ONG) have all indicated that they are registered with GETS, and OG&E’s request to utilize GETS is being processed.

The Government Emergency Telecommunications Service (GETS) 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). It 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.48

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 limits uncertainty.

ESF-15 of the Oklahoma Emergency Operations Plan provides the framework for Oklahoma’s public information program protocol to be followed during all types of emergencies. OEM is this state 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 the 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 as a means to facilitate ongoing communication and relationships, and in addition, OEM offers training classes for communications personnel that meets 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 (EOC), the media center set up at the site of the incident, or at a Joint Field Office (JFO). The JIC will be the primary field location for the coordination of federal, state, and local media relations. The information collected by the JIC will be disseminated according to the Joint Information System (JIS).

**Alternative Outlets for Information Flow**
In order to disseminate public information, governmental agencies might consider setting up information booths at the disaster sites themselves, contacting the media, and/or establishing broader public education programs. The appropriate tool for information dissemination depends upon the energy emergency itself. Additional mechanisms of dissemination might include the following:

- 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, 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, or other 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.

It is the State Emergency Information Officer’s responsibility to provide the public, via the news media, accurate and timely information about emergency and disaster response and recovery operations. This will reduce or eliminate inaccurate information that may arise and ensure vital emergency and disaster information is delivered to the citizens of the State of Oklahoma.

The PIO must be present at any and 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 message. The early activation and deployment of a PIO along with other key 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, who 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 and providing this information to the JIS, and providing multilingual media support operations for the disaster, as appropriate to the community need.

The information collection and dissemination process will conform to the following phases of energy emergency management:
• Phase I: Monitor and Alert
  o Conduct public awareness programs
  o Coordinate with public and private sector partners and the media
• Phase II: Assess and Determine Action
  o Conduct public education programs
  o Prepare external affairs plans and exercise those plans
• Phase III: Actions and Feedback
  o Release public information
  o Coordinate rumor control
  o Schedule news conferences and other events
  o Handle legislative and Congressional inquiries
• Phase IV: Review Lessons Learned
  o Provide public information
  o Handle legislative and Congressional inquiries
  o Provide community relations
  o Compile records of and document event
  o 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 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 in 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 has 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 that officials have to work with.

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 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 prevent electric outages. As one means of prevention, Oklahoma electric providers and the Commission for years have worked together to keep electric power lines away from the ice and trees, as a major contributor to electric outages is ice accumulation and tree limbs pulling down lines. When a segment of lines sags toward or drops on the ground, the weight of the fallen lines causes the utility poles on both sides of that strand to pull inward and possibly snap. This causes the next segment of line to pull down, affecting the next poles and 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, both of the state’s major electric utilities, PSO and OG&E, have been authorized funding for a vegetation management rider designed to get the utilities on a four-year trim cycle. The electric company inspects and trims the right-of-way along one-fourth of its system each year. Working with contractors, the companies have designed a program to trim trees so that it will take limbs four years or longer to grow back into an area where they may become entangled with the electric lines.

To lessen the potential for ice accumulation or damage from falling trees, housing additions constructed since the 1970s have featured buried electric cables. This reduces the number of outages by keeping the lines away from weather damage. However, when damage does occur it takes longer to locate and repair the problem than when working on the more accessible overhead lines.

To prevent wind damage, for some time the major electric transmission system has been built to minimize 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 held to a minimum. The program emphasizes periodic reinforcement of poles within the distribution system to stop, or slow, the cascading affect and significantly lessen the number of poles that are damaged, and, thus reduce restoration time and expense.

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 comes down, the weight of the falling lines does not create a domino effect and pull down subsequent poles.

This combination program of vegetation management on overhead lines coupled with an undergrounding program reduces exposure to weather and lessens the number of storm damage outages.

To prevent accidental disruptions, the Oklahoma One Call System, known as CallOkie, requires companies and private citizens to call one number before digging on their property—by calling in the location of the proposed dig, the utilities can come out and mark their 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 the damage to the system and restore service as quickly as possible. There are several actions specific to Oklahoma that are helping utilities shorten their time of outage after emergencies.

First, by utilizing forecasting techniques such as the Sperry-Piltz Ice Accumulation (SPIA) Index developed in Oklahoma\(^{49}\) (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 of outages. Using experiences from previous ice storms, the SPIA Index uses an ice accumulation algorithm and subsequent utility damage index to predict both the location & severity of ice accumulations three to four days in advance, and to classify potential electric utility system damage on a scale, enabling early warnings of major ice storms to electric utilities and other 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 (WFO). 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 & 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 towards more redundant transmission systems. Under this initiative, if a community loses power due to storm damage of transmission lines, or generation outages, power can be delivered through another loop, so that the power stays on while repairs are underway.

Building on this program is the new installation of smart meters. Oklahoma is a leader in deployment of smart meter technology; in fact, OG&E is 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. This project is now nearly complete. In addition, Public Service Company of Oklahoma is conducting a smart meter pilot program encompassing all customers within the cities of Owasso, Sand Springs and Okmulgee. Smart meters initially will allow customers more information, and, hence, more control over their electric usage. They also allow the utility to automate some system functions, such as meter reading, connects and disconnects, and also assist in more rapidly locating outages and starting repairs sooner. When fully implemented, smart meter technology will lead to smart grid technology and ultimately to a “self-healing” grid that is capable of isolating problem areas and automatically rerouting service around that location.

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\(^{49}\) Sidney K. Sperry, Oklahoma Association of Electric Cooperatives and Steve Piltz, Chief Meteorologist for the National Weather Service in Tulsa, designed the SPIA Index.
Utilities are required by the OCC to plan for outage situations, and under the Oklahoma Administrative Code (165:35-19-4), each year must file 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 their Plans:

(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 or not 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 upon ease of restoration for the greatest use of money, time, and effort. Priority shall be given to 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 shall be restored to schools as quickly as feasible, during such time of the year that school is in session.

(5) Attempted notification of high-priority customers or major electric/gas consuming facilities that are affected by the service outage, when possible. Radio and/or television should be utilized to notify larger numbers of customers as to the type of service outage, 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 Consumer Services Division to implement the process outlined in paragraphs A through C below. The Commission notification process to the designated Consumer Services Division individual(s) may be accomplished by one or more of the following methods: business telephone and/or e-mail address during the business hours of 8:00 a.m. through 4:30 p.m. Monday through Friday, or emergency cellular telephone number after normal business hours, weekends and 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 4 hours or more and involve 1% or fifty (50) customers or more of the utility’s meter count, 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 restoration of service plan implementation.
In addition, the Oklahoma Administrative Code (165:35-33-7(f)) requires electric utilities to develop and keep updated a 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 secure those facilities from extended service interruptions. Utilities keep these plans in a confidential location on-site, but are required to notify the Corporation Commission each year that the Plan is updated. By understanding the precise location of critical infrastructure and planning to keep these secured, utilities can minimize 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 (SEE) 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 Oklahoma Association of Electric Cooperatives coordinates mutual aid responses for all of its members using a standardized agreement in place across the membership. OAEC works with FEMA, and also obtains information from affected members about how much assistance and equipment is needed, and coordinates logistics when possible. It is important to note that because voltages and construction of the lines and circuitry tend to differ between cooperative, investor owned, and municipal electric providers, it can create safety issues 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 time of electric outages. For instance, the Federal Emergency Management Agency (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 of 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 time of 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, as mentioned above, the list below outlines a variety of specific options energy emergency responders may choose to take when responding to electric outages. Additional details regarding each of these options can be found in Appendix D.
Managing Supply

- Participate in regional planning and transmission organizations (Southwest Power Pool).[50]
- Temporarily increase levels of coal stockpiling by electric utility companies.
- Temporarily substitute Oklahoma coal for Wyoming coal in coal-fired power plants.
- Reduce voltage in the system.
- Utilize 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 system-wide rolling blackouts.
- Enact voluntary or mandatory curtailment of public building energy use.
- Employ and/or expand time-of-use rates for residential and/or industrial users.
- Utilize the co-generation 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, add insulation, or change lighting.
- 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.
- 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

[50] Oklahoma is one of nine states located within the footprint of the Southwest Power Pool (SPP) which operates as a Regional Transmission Organization (RTO). RTOs were formed to maintain electric reliability and coordination and are mandated by the Federal Energy Regulatory Commission (FERC) 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.
reliable supply for consumers. In this industry, the Oklahoma Corporation Commission 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 oil and petroleum industries. At the federal level, much of the regulation occurs through the U.S. Environmental Protection Agency (EPA). At the state level, both the OCC and the Department of Environmental Quality (DEQ) provide regulatory oversight.

First, the OCC’s Oil and Gas Conservation Division regulates crude oil well sites in the state, utilizing four regional offices to conduct administrative and on-site activities. Each district office is comprised of a manager, an environmental quality expert, and a number of field inspectors. Regulation of the oil industry at the drilling site is structured by Chapter 10 of the OCC Rules (OAC 165:10). Chapter 10 includes technical rules on safe well drilling, use of proper equipment, and protecting groundwater as well as reporting requirements for any site incidents. Inspectors visit well sites and issue field citations to ensure compliance with Chapter 10. Each well site is inspected at least once every five years, but high risk and high capacity wells are inspected much more frequently—often several times per year. These sites include those that utilize commercial disposal pits and those which have large on-site disposal pits. In addition to conducting field inspections, the inspectors also coordinate with county emergency managers to ensure a safe environment for the public.

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. Department of Transportation regulates interstate lines. These inspection and maintenance programs ensure the safe operation of the pipeline facilities and significantly lessen the likelihood of a fuel supply interruption to the generating plants.

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

Once crude oil is refined and processed into motor vehicle fuel, OCC once again assumes regulatory authority, for the storage of this motor vehicle fuel onsite at filling stations statewide. Chapters 25, 26 and 29 of the OCC rules (OAC 165:25-26, 29) outline the Commission’s authority in ensuring safe petroleum storage. 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 these test results. To ensure compliance, the Commission’s Petroleum Storage Tank Division (PSTD) employs 18 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

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51 Large urban areas in the state (Oklahoma City and Tulsa) also employ their own site inspectors.
and request an investigation if non-compliance is discovered. If an incident occurs, 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 now file
blueprints of underground tanks and lines with the OCC PSTD.

**Mitigation Measures after Supply Interruptions**

In the event of a spill, explosion, or other well site emergency, 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 blow out, and must report any explosions or fires immediately. Chapter 10 rules
require well owners to report these incidents to the relevant OCC field 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 file a remediation plan with the OCC. If a well is abandoned and
an incident occurs, OCC has the ability to order this well plugged by using a State fund capitalized by oil
well operators. In emergency situations, OCC can utilize a Governor’s letter and an emergency hearing
before the Commission to plug a well in a matter of days or less.

At the federal level, the U.S. EPA is also involved in regulating various aspects of the oil industry in
Oklahoma. First, the Superfund Amendments and Reauthorization Act (SARA), Title 3—which is enforced
by the EPA—requires operators to notify local first responders if the well site stores chemicals onsite.
This provision ensures that responders onsite to any type of spill or explosion will be able to adequately
take precautions and respond effectively to mitigate damage. EPA also has oversight over any location
which affects “waters of the United States.” Finally, any oil storage facility must file a Spill Prevention,
Control, and Countermeasure Plan (SPCC) with the EPA.

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. 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 now file blueprints
of underground tanks and lines with the OCC PSTD. The EPA is also involved with inspecting petroleum
storage tanks. Under CFR 280 Chapter 40, EPA inspectors conduct periodic inspections of storage tanks
and if violations are found, EPA works collaboratively with the OCC staff to lockdown the tank and
remediate the violation.

When an outage does occur, even as the industry works to limit the supply disruption it is critical that
responders have a variety of options available to them to manage supply and demand for oil and
petroleum during the interruption. Therefore, as mentioned above, the list below outlines a variety of
specific options energy emergency responders may choose to take when responding to oil or petroleum
supply disruptions. Additional details regarding each of these options can be found in Appendix D.
Managing Supply
- State of Oklahoma assumes control of fuel prioritization.
- Temporarily lift Federal Motor Carrier Safety Regulations (FMCSR) for over the road transport 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. Environmental Protection Agency (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 to be used for highway consumption.
- 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. Department of Energy 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.
- Offer discounted rates or incentives for utilizing 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 to help protect a stable supply of gas. First, the Pipeline Safety Section of the Transportation Division’s Enforcement Department within the OCC is responsible for ensuring that intrastate natural gas and hazardous pipeline operators comply 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 two field supervisors and ten field inspectors inspect the records and field operations of operators statewide, as well as perform site inspections. It is important to note that pipelines located between the wells and the gathering lines...
are not subject to state inspection or regulation except for reporting of major incidents; gathering lines located in rural areas (approximately 80% of the state) are also not subject to state regulation. Interstate pipeline operators are subject only to safety regulations enforced by the U.S. Department of Transportation’s Pipeline and Hazardous Materials Safety Administration (PHMSA), but PHMSA is in daily email 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 Gas (ONG) to undertake a complete inspection and, where needed, upgrade its transmission lines in segments over a several 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 ONG to fund this program through implementation of an Integrity Management rider for several years, until the company’s 2011 rate review. Earlier in the decade, ONG had 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.

The state’s other major natural gas utility, CenterPoint Energy of 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. Department of Transportation. CenterPoint remains responsible for the maintenance of its distribution system. In addition to the Corporation Commission’s Public Utility Division, regulation of this distribution system also falls under the Commission’s Pipeline Safety Section.

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 call one number before digging on their property—by calling in the location of the proposed dig, the utilities can come out and mark their lines to avoid damage to underground facilities.

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 Section. Reports of code violations go to the pipeline operator for correction. If the violation is serious or the operator repeatedly violates regulations, Pipeline Safety will recommend an enforcement action to be filed. In the case of an accident with environmental

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52 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, loss of a life, 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.
consequences, OCC and the Department of Environmental Quality have an MOU that oversees cleanup of crude oil or condensates from gas. 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 4 hours or more and involve 1% or 50 customers or more, whichever is greater, of the company’s total meter count.

As the collection point for reports of pipeline emergencies, the Pipeline safety section maintains an on call employee (rotates weekly) who is available in emergency situations that can be contacted 24/7. Pipeline Safety personnel are not first responders, but they play an important role as evaluators of information. Pipeline Safety personnel may call operators to substantiate information or send inspectors to commence an investigation. Operators are required to conduct failure investigations and the Pipeline Safety Section audits the 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 the Oklahoma Administrative Code (OAC 165:45-9-2), each year must file 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 their Plans:

(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 or not 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 upon ease of restoration for the greatest use of money, time, and effort. Priority shall be given to any life-threatening situations known or discovered during restoration of service.

An excerpt from CenterPoint Oklahoma’s restoration of service plan follows. This excerpt 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 manpower 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. Request that scrolls, route cards, address lists and/or maps be printed.
7. Isolate the affected area by turning off valves, regulator stations, or other pressure control devices.
8. Identify those responsible for conducting field operations.
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. Additional details regarding each of these options can be found in Appendix D.
**Managing Supply**
- Temporarily lift wellhead restrictions on the production of natural gas so as to allow companies to pump as much as possible.
- Allow pipeline pack to increase reserve supplies available.
- Local gas distribution companies (LDC) can purchase additional gas in order to meet demand.
- Gas companies that are drawing gas from storage facilities can increase the rate of withdrawal in order to meet increased short-term demand.
- Encourage or require gas companies when technically feasible to access and utilize 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 utilize when mitigating and responding to energy emergencies. It is intended as an additional “tool in the toolbox” for government and private sector partners to utilize in a way that will minimize the impact of future energy emergencies.

The importance of fostering an ongoing dialogue regarding energy assurance cannot be overestimated. Therefore it is Oklahoma’s intent to regularly revisit 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 Energy Assurance Plan continues to best provide information and direction to energy planners and responders for many years into the future.

At any time, questions and comments regarding the Energy Assurance Plan may be directed to the Oklahoma Department of Commerce’s State Energy Office: please contact Kylah McNabb at (405) 815-5249 or Kylah_McNabb@odoc.state.ok.us.
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 Oklahoma Corporation Commission requires regulated utilities to perform detailed tracking of outage information—this is a part of determining SAIFI and SAIDI. Aggregated information is provided annually to the Public Utility Division and is summarized in an annual Reliability 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*
http://public.oge.com/systemwatch/

*Public Service Company of Oklahoma*
https://www.psoklahoma.com/outages/

*Empire District Electric Company*

In outage situations, as described in the Mitigating, Tracking, and Responding to Energy Emergencies section of this Plan, utilities also 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 data compiled is sourced from the Energy Information Administration (EIA) and the U.S. Department of Energy.
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 data compiled is sourced from the Energy Information Administration (EIA) and the U.S. Department of Transportation Pipeline & Hazardous Materials Safety Administration.

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 data compiled is sourced from the Energy Information Administration (EIA) and the American Automobile Association.
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 Oklahoma Corporation Commission (OCC) does not directly regulate these cooperatives in terms of rates, the OCC is responsible for monitoring the status and reliability of each provider.

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

*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

<table>
<thead>
<tr>
<th>Station Name</th>
<th>Address</th>
<th>City</th>
<th>Access Groups</th>
<th>Fill Rate</th>
<th>PSI</th>
<th>Access Method</th>
<th>Contact</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chickasaw Nation Ada Travel Stop West</td>
<td>14565 CR 3544 (201 Latta Rd.)</td>
<td>Ada</td>
<td>Public access, C-Store location; 24 hours</td>
<td>Quick fill</td>
<td>3600 psi &amp; 3000 psi</td>
<td>VISA, MasterCard, Voyager, Wright Express, cash</td>
<td>580-310-0900</td>
</tr>
<tr>
<td>Love’s Country Store #8</td>
<td>619 N. Main</td>
<td>Altus</td>
<td>Public access, C-store location, 24 hours</td>
<td>Quick fill</td>
<td>3600 psi</td>
<td>Cash, All Major Credit Cards; VISA, MasterCard, Comdata, Voyager, Wright Express</td>
<td>580-482-6167</td>
</tr>
<tr>
<td>ONG Anadarko Service Center</td>
<td>1700 E. Central</td>
<td>Anadarko</td>
<td>Public access, non-attended; 24 hours</td>
<td>Quick fill</td>
<td>3000 psi</td>
<td>VISA, MasterCard, FUELMAN, Voyager</td>
<td>405-551-6601 or 888-609-2410</td>
</tr>
<tr>
<td>ONG Southern Oklahoma Development Association</td>
<td>1995 Veterans Blvd.</td>
<td>Ardmore</td>
<td>Public access with restrictions, non-attended; 24 hours</td>
<td>Quick fill</td>
<td>3600 psi &amp; 3000 psi</td>
<td>VISA, MasterCard, FUELMAN, Voyager</td>
<td>405-551-6601 or 888-609-2410</td>
</tr>
<tr>
<td>OnCue Express</td>
<td>4419 Main</td>
<td>Arkoma</td>
<td>Public access, non-attended; 24 hours</td>
<td>Quick fill</td>
<td>3600 psi</td>
<td>VISA, MasterCard, FUELMAN, Voyager, Wright Express</td>
<td>405-372-3579</td>
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<tr>
<td>ONG Bartlesville Service Center</td>
<td>3601 N.E. Indiana</td>
<td>Bartlesville</td>
<td>Public access, non-attended; 24 hours</td>
<td>Quick fill</td>
<td>3000 psi</td>
<td>VISA, MasterCard, FUELMAN, Voyager</td>
<td>405-551-6601 or 888-609-2410</td>
</tr>
<tr>
<td>Station Name</td>
<td>Address</td>
<td>City</td>
<td>Access Groups</td>
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<tr>
<td>ONG Broken Arrow Service Center</td>
<td>2421 S. 1st Place</td>
<td>Broken Arrow</td>
<td>Public access, non-attended; 24 hours</td>
<td>Quick fill</td>
<td>3000 psi</td>
<td>VISA, MasterCard, FUELMAN, Voyager</td>
<td>405-551-6601 or 888-609-2410</td>
</tr>
<tr>
<td>Love's Country Store #86</td>
<td>1326 S. 4th</td>
<td>Chickasha</td>
<td>Public access, C-store location, 24 hours</td>
<td>Quick fill</td>
<td>3600 psi</td>
<td>Cash, All Major Credit Cards; VISA, MasterCard, Comdata, Voyager, Wright Express</td>
<td>405-222-2355</td>
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<tr>
<td>ONG Claremore Office</td>
<td>1449 S.W. Country Club Rd.</td>
<td>Claremore</td>
<td>Public access, non-attended; 24 hours</td>
<td>Quick fill</td>
<td>3000 psi</td>
<td>VISA, MasterCard, FUELMAN, Voyager</td>
<td>405-551-6601 or 888-609-2410</td>
</tr>
<tr>
<td>Domino Fuel &amp; Food #1</td>
<td>1715 S. 4th</td>
<td>Clinton</td>
<td>Public access, C-store &amp; truck stop location; 24 hours</td>
<td>Quick fill</td>
<td>3600 psi</td>
<td>VISA, MasterCard, FUELMAN, Voyager, Wright Express &amp; all major fuel and credit cards</td>
<td>580-323-0341</td>
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<tr>
<td>ONG Clinton Service Center</td>
<td>500 W. Commerce</td>
<td>Clinton</td>
<td>Public access, non-attended; 24 hours</td>
<td>Quick fill</td>
<td>3000 psi</td>
<td>VISA, MasterCard, FUELMAN, Voyager</td>
<td>405-551-6601 or 888-609-2410</td>
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<tr>
<td>ONG Davenport CNG Maintenance Facility</td>
<td>1028 N. Preston</td>
<td>Davenport</td>
<td>Public access, non-attended; 24 hours</td>
<td>Quick fill</td>
<td>3000 psi</td>
<td>VISA, MasterCard, FUELMAN, Voyager</td>
<td>405-551-6601 or 888-609-2410</td>
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<tr>
<td>OnCue Express #107</td>
<td>5500 S.E. 29th</td>
<td>Del City</td>
<td>Public access, C-store location; 24 hours</td>
<td>Quick fill</td>
<td>3600 psi</td>
<td>Cash, VISA, Master Card, FUELMAN, Voyager, Wright Express</td>
<td>405-672-3420</td>
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<tr>
<td>OnCue Express #105</td>
<td>800 S. Broadway</td>
<td>Edmond</td>
<td>Public access, C-store location; 24 hours</td>
<td>Quick fill</td>
<td>3600 psi</td>
<td>VISA, Master Card, FUELMAN, Voyager, Wright Express, cash, debit</td>
<td>405-330-6009</td>
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<tr>
<td>Total Express</td>
<td>16401 N. Rockwell</td>
<td>Edmond</td>
<td>Public access, C-store location; 24 hours</td>
<td>Quick fill</td>
<td>3600 psi</td>
<td>Cash, VISA, MasterCard,</td>
<td>405-348-3835</td>
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<tr>
<td>Station Name</td>
<td>Address</td>
<td>City</td>
<td>Access Groups</td>
<td>Fill Rate</td>
<td>PSI</td>
<td>Access Method</td>
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<tr>
<td>OnCue Express</td>
<td>Ave., Ste. 100</td>
<td></td>
<td>Store location; 24 hours</td>
<td>Quick fill</td>
<td>3600 psi</td>
<td>American Express, Discover, Voyager, Wright Express</td>
<td></td>
</tr>
<tr>
<td>OnCue Express #26</td>
<td>3400 S. Radio Road</td>
<td>El Reno</td>
<td>Public access, non-attended; 24 hours</td>
<td>Quick fill</td>
<td>3600 psi</td>
<td>VISA, MasterCard, FUELMAN, Voyager, Wright Express</td>
<td>405-330-6009</td>
</tr>
<tr>
<td>Hutch's #119</td>
<td>20207 E. 1110 County Road</td>
<td>Elk City</td>
<td>Public access, C-Store location; 24 hours</td>
<td>Quick fill</td>
<td>3600 psi</td>
<td>American Express, Discover, MasterCard, VISA, Voyager, Wright Express</td>
<td>580-303-4515</td>
</tr>
<tr>
<td>Hutchinson Oil Co.</td>
<td>515 S. Main</td>
<td>Elk City</td>
<td>Public access, non-attended; 24 hours</td>
<td>Quick fill</td>
<td>3600 psi</td>
<td>VISA, MasterCard, FUELMAN, Voyager</td>
<td>405-551-6601 or 888-609-2410</td>
</tr>
<tr>
<td>OnCue Express #26</td>
<td>1005 E. Owen K. Garriot</td>
<td>Enid</td>
<td>Public access, C-Store location; 24 hours</td>
<td>Quick fill</td>
<td>3600 psi</td>
<td>Cash, VISA, Master Card, FUELMAN, Voyager, Wright Express</td>
<td>580-237-4898</td>
</tr>
<tr>
<td>ONG Enid Service Center</td>
<td>421 S. Garland Rd.</td>
<td>Enid</td>
<td>Public access, non-attended; 24 hours</td>
<td>Quick fill</td>
<td>3000 psi</td>
<td>VISA, MasterCard, FUELMAN, Voyager</td>
<td>405-551-6601 or 888-609-2410</td>
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<tr>
<td>L&amp;S Fuels, LLC</td>
<td>120 Cedar Springs Rd.</td>
<td>Fairview</td>
<td>Public access, non-attended; 24 hours</td>
<td>Quick fill</td>
<td>3600 psi</td>
<td>Discover, MasterCard, VISA, FUELMAN, Voyager, Wright Express</td>
<td>580-227-0999 or 580-227-0322</td>
</tr>
<tr>
<td>Tillman's Producers Co-op</td>
<td>507 S. Main</td>
<td>Frederick</td>
<td>Public access, non-attended; 24 hours</td>
<td>Quick fill</td>
<td>3000 psi</td>
<td>VISA, MasterCard, FUELMAN, Voyager</td>
<td>405-551-6601 or 888-609-2410</td>
</tr>
<tr>
<td>Loves Country Store #218</td>
<td>2530 E Noble Ave.</td>
<td>Guthrie</td>
<td>Public access, C-Store location; 24 hours</td>
<td>Quick fill</td>
<td>3600 psi</td>
<td>Cash, All Major Credit Cards; VISA, MasterCard, Comdata, Voyager, Wright Express</td>
<td>405-260-0850</td>
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<tr>
<td>Station Name</td>
<td>Address</td>
<td>City</td>
<td>Access Groups</td>
<td>Fill Rate</td>
<td>PSI</td>
<td>Access Method</td>
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<tr>
<td>ONG Guthrie Service Center</td>
<td>205 Sigma Place</td>
<td>Guthrie</td>
<td>Public access, non-attended; 24 hours</td>
<td>Quick fill</td>
<td>3000 psi</td>
<td>VISA, MasterCard, FUELMAN, Voyager</td>
<td>405-551-6601 or 888-609-2410</td>
</tr>
<tr>
<td>Love's Country Store #19</td>
<td>101 S.E. 2nd Snr</td>
<td>Guymon</td>
<td>Public access, C-store location, 24 hours</td>
<td>Quick fill</td>
<td>3600 psi</td>
<td>Cash, All Major Credit Cards; VISA, MasterCard, Comdata, Voyager, Wright Express</td>
<td>580-338-2414</td>
</tr>
<tr>
<td>Love's Country Store #5</td>
<td>203 S. Main</td>
<td>Kingfisher</td>
<td>Public access, C-Store location; 24 hours</td>
<td>Quick fill</td>
<td>3600 psi</td>
<td>Cash, All Major Credit Cards; VISA, MasterCard, Comdata, Voyager, Wright Express</td>
<td>405-375-5019</td>
</tr>
<tr>
<td>Love's Travel Stop #263</td>
<td>24169 State Hwy 49</td>
<td>Lawton</td>
<td>Public access, C-store location; 24 hours</td>
<td>Quick fill</td>
<td>3600 psi</td>
<td>Cash, All Major Credit Cards; VISA, MasterCard, Comdata, Voyager, Wright Express</td>
<td>580-529-2882</td>
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<tr>
<td>OnCue Express</td>
<td>2508 S. 4th</td>
<td>Lindsay</td>
<td>Public access, non-attended; 24 hours</td>
<td>Quick fill</td>
<td>3600 psi</td>
<td>VISA, MasterCard, FUELMAN, Voyager, Wright Express</td>
<td>405-372-3579</td>
</tr>
<tr>
<td>ONG Miami Service Center</td>
<td>11 S. Treaty Rd.</td>
<td>Miami</td>
<td>Public access, non-attended; 24 hours</td>
<td>Quick fill</td>
<td>3000 psi</td>
<td>VISA, MasterCard, FUELMAN</td>
<td>405-551-6601 or 888-609-2410</td>
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<tr>
<td>7-Eleven</td>
<td>1919 S. Eastern Ave.</td>
<td>Moore</td>
<td>Public access, C-store location, 24 hours</td>
<td>Quick fill</td>
<td>3600 psi</td>
<td>VISA, MasterCard</td>
<td>405-793-1328</td>
</tr>
<tr>
<td>ONG Muskogee Service Center</td>
<td>2616 W. Border</td>
<td>Muskogee</td>
<td>Public access, non-attended; 24 hours</td>
<td>Quick fill</td>
<td>3000 psi</td>
<td>VISA, MasterCard, FUELMAN, Voyager</td>
<td>405-551-6601 or 888-609-2410</td>
</tr>
<tr>
<td>ONG Mustang Service</td>
<td>680 E. Highway 152</td>
<td>Mustang</td>
<td>Public access, non-attended; 24 hours</td>
<td>Quick fill</td>
<td>3000 psi</td>
<td>VISA, MasterCard, FUELMAN, Voyager</td>
<td>405-551-6601 or 888-609-2410</td>
</tr>
<tr>
<td>Station Name</td>
<td>Address</td>
<td>City</td>
<td>Access Groups</td>
<td>Fill Rate</td>
<td>PSI</td>
<td>Access Method</td>
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<tr>
<td>Center</td>
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<td></td>
<td>attended; 24 hours</td>
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<tr>
<td>City of Norman</td>
<td>2351 Goddard Ave.</td>
<td>Norman</td>
<td>Public access, non-attended; 24 hours</td>
<td>Quick fill</td>
<td>3600 psi &amp; 3000 psi</td>
<td>VISA, MasterCard</td>
<td>405-292-9709</td>
</tr>
<tr>
<td>Love's Travel Stop #260</td>
<td>5317 S.E. 44th Street; Exit 106, I-35 &amp; SH 9 W</td>
<td>Norman</td>
<td>Public access, C-store location; 24 hours</td>
<td>Quick fill</td>
<td>3600 psi</td>
<td>Cash, All Major Credit Cards; VISA, MasterCard, Comdata, Voyager, Wright Express</td>
<td>405-364-0059</td>
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<tr>
<td>ONG Norman Service Center</td>
<td>605 N. Berry</td>
<td>Norman</td>
<td>Public access, non-attended; 24 hours</td>
<td>Quick fill</td>
<td>3000 psi</td>
<td>VISA, MasterCard, FUELMAN, Voyager</td>
<td>405-551-6601 or 888-609-2410</td>
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<tr>
<td>Love's Travel Stop #274</td>
<td>102 W. Copeland</td>
<td>Okemah</td>
<td>Public access, C-store location; 24 hours</td>
<td>Quick fill</td>
<td>3600 psi</td>
<td>Cash, All Major Credit Cards; VISA, MasterCard, Comdata, Voyager, Wright Express</td>
<td>918-623-2024</td>
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<tr>
<td>Clean Energy Will Rogers World Airport</td>
<td>4424 Amelia Earhart</td>
<td>Oklahoma City</td>
<td>Public access, non-attended; 24 hours</td>
<td>Quick fill</td>
<td>3600 psi &amp; 3000 psi</td>
<td>VISA, MasterCard, Voyager, Wright Express, Clean Energy</td>
<td>303-322-4600</td>
</tr>
<tr>
<td>Love's Travel Stop #203</td>
<td>800 S. Morgan Rd. (I-40 &amp; Morgan Rd.)</td>
<td>Oklahoma City</td>
<td>Public access, C-store &amp; truck stop location; 24 hours; heavy duty CNG fill nozzle for Class 8 trucks</td>
<td>Quick fill</td>
<td>3600 psi</td>
<td>Cash, All Major Credit Cards; VISA, MasterCard, Comdata, Voyager, Wright Express</td>
<td>405-789-0087</td>
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<tr>
<td>Love's Travel Stop #205</td>
<td>12225 N. I-35</td>
<td>Oklahoma City</td>
<td>Public access, C-store location; 24 hours</td>
<td>Quick fill</td>
<td>3600 psi</td>
<td>Cash, All Major Credit Cards; VISA, MasterCard, Comdata, Voyager, Wright Express</td>
<td>405-478-5766</td>
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<tr>
<td>Station Name</td>
<td>Address</td>
<td>City</td>
<td>Access Groups</td>
<td>Fill Rate</td>
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<tr>
<td>Love’s Country Store #245</td>
<td>3233 S.W. 89th</td>
<td>Oklahoma City</td>
<td>Public access, 24-store location; 24 hours</td>
<td>Quick fill</td>
<td>3600 psi</td>
<td>Cash, All Major Credit Cards; VISA, MasterCard, Comdata, Voyager, Wright Express</td>
<td>405-686-1053</td>
</tr>
<tr>
<td>OnCue Express #100</td>
<td>5900 W. Reno</td>
<td>Oklahoma City</td>
<td>Public access, 24-store location; 24 hours</td>
<td>Quick fill</td>
<td>3600 psi</td>
<td>Cash, VISA, MasterCard, FUELMAN, Voyager, Wright Express</td>
<td>405-787-2255</td>
</tr>
<tr>
<td>OnCue Express #101</td>
<td>1 N.W. 23rd</td>
<td>Oklahoma City</td>
<td>Public access, 24-store location; 24 hours</td>
<td>Quick fill</td>
<td>3600 psi</td>
<td>Cash, VISA, MasterCard, FUELMAN, Voyager, Wright Express</td>
<td>405-557-1170</td>
</tr>
<tr>
<td>OnCue Express #191</td>
<td>4920 N. Western Ave.</td>
<td>Oklahoma City</td>
<td>Public access, non-attended; 24 hours</td>
<td>Quick fill</td>
<td>3600 psi &amp; 3000 psi</td>
<td>VISA, MasterCard, Wright Express</td>
<td>405-935-6475</td>
</tr>
<tr>
<td>ONG Southside Service Center</td>
<td>422 S.E. 59th</td>
<td>Oklahoma City</td>
<td>Public access, non-attended; 24 hours</td>
<td>Quick fill</td>
<td>3600 psi &amp; 3000 psi</td>
<td>VISA, MasterCard, FUELMAN, Voyager</td>
<td>405-551-6601 or 888-609-2410</td>
</tr>
<tr>
<td>Reno Partners Conoco</td>
<td>3701 W. Reno</td>
<td>Oklahoma City</td>
<td>Public access, 24-store location; 24 hours</td>
<td>Quick fill</td>
<td>3600 psi</td>
<td>Cash, American Express, Discover, VISA, MasterCard, GasCard, Voyager, Wright Express</td>
<td>405-942-4931</td>
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<tr>
<td>RS Fuel Phillips 66</td>
<td>3330 W. Memorial Rd.</td>
<td>Oklahoma City</td>
<td>Public access, 24-store location; pumps accessible 24 hours; store hours 6:00 AM - 11:00 PM</td>
<td>Quick fill</td>
<td>3600 psi</td>
<td>Cash, VISA, MasterCard, CONOCO, FUELMAN, Phillips66, Voyager, Wright Express</td>
<td>405-748-4277</td>
</tr>
<tr>
<td>ONG Okmulgee Service</td>
<td>2018 S. Wood Drive</td>
<td>Okmulgee</td>
<td>Public access, non-attended; 24 hours</td>
<td>Quick fill</td>
<td>3000 psi</td>
<td>VISA, MasterCard, FUELMAN, Voyager</td>
<td>405-551-6601 or 888-609-2410</td>
</tr>
<tr>
<td>Station Name</td>
<td>Address</td>
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<td>Fill Rate</td>
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<td>Contact</td>
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<tr>
<td>City of Owasso - Blue Energy Fuels</td>
<td>101 S. Main</td>
<td>Owasso</td>
<td>Public access, non-attended; 24 hours</td>
<td>Quick fill</td>
<td>3600 psi</td>
<td>VISA, MasterCard, FUELMAN, Voyager</td>
<td>918-641-2583</td>
</tr>
<tr>
<td>ONG Pauls Valley Service Center</td>
<td>1701 W. Airline Rd.</td>
<td>Pauls Valley</td>
<td>Public access, non-attended; 24 hours</td>
<td>Quick fill</td>
<td>3000 psi</td>
<td>VISA, MasterCard, FUELMAN, Voyager</td>
<td>405-551-6601 or 888-609-2410</td>
</tr>
<tr>
<td>ONG Ponca City Service Center</td>
<td>2205 N. Ash</td>
<td>Ponca City</td>
<td>Public access with restrictions</td>
<td>Quick fill</td>
<td>3000 psi</td>
<td>VISA, MasterCard, FUELMAN, Voyager</td>
<td>405-551-6601 or 888-609-2410</td>
</tr>
<tr>
<td>ONG Sapulpa Service Center</td>
<td>410 S. Hawthorn</td>
<td>Sapulpa</td>
<td>Public access, non-attended; 24 hours</td>
<td>Quick fill</td>
<td>3000 psi</td>
<td>VISA, MasterCard, FUELMAN, Voyager</td>
<td>405-551-6601 or 888-609-2410</td>
</tr>
<tr>
<td>ONG Shawnee Service Center</td>
<td>1444 N. Kickapoo</td>
<td>Shawnee</td>
<td>Public access, non-attended; 24 hours</td>
<td>Quick fill</td>
<td>3600 psi &amp; 3000 psi</td>
<td>VISA, MasterCard, FUELMAN, Voyager</td>
<td>405-551-6601 or 888-609-2410</td>
</tr>
<tr>
<td>Clean Energy Oklahoma State University</td>
<td>1323 W. Lakeview Drive</td>
<td>Stillwater</td>
<td>Public access, non-attended; 24 hours</td>
<td>Quick fill</td>
<td>3600 psi &amp; 3000 psi</td>
<td>VISA, MasterCard, Voyager, Wright Express, Clean Energy</td>
<td>405-744-7938</td>
</tr>
<tr>
<td>OnCue Express #14</td>
<td>1402 S. Perkins Rd.</td>
<td>Stillwater</td>
<td>Public access, C-Store location; 24 hours</td>
<td>Quick fill</td>
<td>3600 psi</td>
<td>Cash, VISA, MasterCard, FUELMAN, Voyager, Wright Express</td>
<td>405-624-9091</td>
</tr>
<tr>
<td>ONG Stillwater Service Center</td>
<td>3424 N. Perkins Rd.</td>
<td>Stillwater</td>
<td>Public access, non-attended; 24 hours</td>
<td>Quick fill</td>
<td>3000 psi</td>
<td>VISA, MasterCard, FUELMAN, Voyager</td>
<td>405-551-6601 or 888-609-2410</td>
</tr>
<tr>
<td>Phillips 66 on the Turner</td>
<td>Stroud Service</td>
<td>Stroud</td>
<td>Public access; 24</td>
<td>Quick fill</td>
<td>3000 psi</td>
<td>VISA, MasterCard, FUELMAN, Voyager</td>
<td>405-551-6601 or</td>
</tr>
<tr>
<td>Station Name</td>
<td>Address</td>
<td>City</td>
<td>Access Groups</td>
<td>Fill Rate</td>
<td>PSI</td>
<td>Access Method</td>
<td>Contact</td>
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</tr>
<tr>
<td>Turnpike (ONG-owned)</td>
<td>Area, center of turnpike at Mile Marker 178</td>
<td>Tulsa</td>
<td>Public access; C-store location; 24 hours</td>
<td>Quick fill</td>
<td>3600 psi</td>
<td>American Express, Discover, VISA, MasterCard</td>
<td>888-609-2410</td>
</tr>
<tr>
<td>Cherokee Conoco Outpost</td>
<td>17699 S. Muskogee Ave.</td>
<td>Tahlequah</td>
<td>Public access; C-store location; 24 hours</td>
<td>Quick fill</td>
<td>3600 psi</td>
<td>American Express, Discover, VISA, MasterCard</td>
<td>918-456-5578</td>
</tr>
<tr>
<td>Northeast Oklahoma Public Facilities Authority (NOPFA Tahlequah CNG Station)</td>
<td>853 N. Woodard Ave.</td>
<td>Tahlequah</td>
<td>Public access; non-attended; 24 hours</td>
<td>Quick fill</td>
<td>3600 psi</td>
<td>VISA, MasterCard, American Express, Discover, Voyager, Wright Express</td>
<td>918-456-5621; or emergency 918-456-3591</td>
</tr>
<tr>
<td>Apache Tulsa</td>
<td>5011 S. Vandalia Ave.</td>
<td>Tulsa</td>
<td>Public access; non-attended; 24 hours</td>
<td>Quick fill</td>
<td>3600 psi</td>
<td>American Express, Discover, VISA, MasterCard, FUELMAN, Voyager, Wright Express</td>
<td>713-296-6000</td>
</tr>
<tr>
<td>Blue Energy Fuels - Tulsa Gas Technologies</td>
<td>4809 S. 101 East Ave.</td>
<td>Tulsa</td>
<td>Public access - call ahead; 8 a.m. - 5 p.m., M-F; 24 hour access w/TGT card; non-card holders must call for attendant; vehicles must be NFPA 52 compliant and inspected</td>
<td>Quick fill</td>
<td>3600 psi &amp; 3000 psi</td>
<td>Cash, Discover, VISA, MasterCard, FUELMAN, Voyager, Wright Express</td>
<td>918-641-2583</td>
</tr>
<tr>
<td>ONG Tulsa</td>
<td>5848 E.</td>
<td>Tulsa</td>
<td>Public</td>
<td>Quick</td>
<td>3600 psi</td>
<td>VISA, MasterCard, FUELMAN, Voyager, Wright Express</td>
<td>405-551-6601</td>
</tr>
<tr>
<td>Station Name</td>
<td>Address</td>
<td>City</td>
<td>Access Groups</td>
<td>Fill Rate</td>
<td>PSI</td>
<td>Access Method</td>
<td>Contact</td>
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<td>--------------------------</td>
</tr>
<tr>
<td>Service Center</td>
<td>15th Street</td>
<td></td>
<td>access, non-attended; 24 hours</td>
<td>fill</td>
<td>psi &amp; 3000 psi</td>
<td>FUELMAN, Voyager</td>
<td>or 888-609-2410</td>
</tr>
<tr>
<td>ONG Tulsa North Service Center</td>
<td>4821 E. 66th Street N.</td>
<td>Tulsa</td>
<td>Public access, non-attended; 24 hours</td>
<td>Quick fill</td>
<td>3000 psi</td>
<td>VISA, MasterCard, FUELMAN, Voyager</td>
<td>405-551-6601 or 888-609-2410</td>
</tr>
<tr>
<td>City of Tulsa West Maintenance Yard</td>
<td>420 W. 23rd</td>
<td>Tulsa</td>
<td>Public access, non-attended; 24 hours</td>
<td>Quick fill</td>
<td>3600 psi</td>
<td>VISA, MasterCard</td>
<td>918-527-0002</td>
</tr>
<tr>
<td>ONG Tulsa Service Center West</td>
<td>7002 S. Union Ave.</td>
<td>Tulsa</td>
<td>Public access, non-attended; 24 hours</td>
<td>Quick fill</td>
<td>3600 psi &amp; 3000 psi</td>
<td>VISA, MasterCard, FUELMAN, Voyager</td>
<td>405-551-6601 or 888-609-2410</td>
</tr>
<tr>
<td>OnCue Express</td>
<td>32744 SH 45</td>
<td>Waynoka</td>
<td>Public access, non-attended; 24 hours</td>
<td>Quick fill</td>
<td>3600 psi</td>
<td>VISA, MasterCard, FUELMAN, Voyager, Wright Express</td>
<td>405-372-3579</td>
</tr>
<tr>
<td>Fast Lane Travel Plaza</td>
<td>1501 N. Airport Rd.</td>
<td>Weatherford</td>
<td>Public access, C-store location; 24 hours</td>
<td>Quick fill</td>
<td>3600 psi</td>
<td>Cash, America Express, Discover, VISA, MasterCard, FUELMAN, GasCard, Voyager, Wright Express</td>
<td>580-772-6076</td>
</tr>
<tr>
<td>OnCue Express</td>
<td>2020 Eagle Road</td>
<td>Weatherford</td>
<td>Public access, non-attended; 24 hours</td>
<td>Quick fill</td>
<td>3600 psi</td>
<td>VISA, MasterCard, FUELMAN, Voyager, Wright Express</td>
<td>405-372-3579</td>
</tr>
<tr>
<td>OnCue Express</td>
<td>4980 Hwy 270W</td>
<td>Wilburton</td>
<td>Public access, non-attended; 24 hours</td>
<td>Quick fill</td>
<td>3600 psi</td>
<td>VISA, MasterCard, FUELMAN, Voyager, Wright Express</td>
<td>405-372-3579</td>
</tr>
<tr>
<td>Hutch's #113</td>
<td>3710 Oklahoma Ave.</td>
<td>Woodward</td>
<td>Public access, C-store</td>
<td>Quick fill</td>
<td>3600 psi</td>
<td>America Express, Discover, VISA, MasterCard,</td>
<td></td>
</tr>
<tr>
<td>Station Name</td>
<td>Address</td>
<td>City</td>
<td>Access Groups</td>
<td>Fill Rate</td>
<td>PSI</td>
<td>Access Method</td>
<td>Contact</td>
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<td>------------------------------</td>
</tr>
<tr>
<td>Love's Travel Stop #266</td>
<td>3201 N.W. 12th</td>
<td>Ardmore</td>
<td>location; 24 hours</td>
<td>Quick fill</td>
<td>3600 psi</td>
<td>Voyager, Wright Express</td>
<td></td>
</tr>
<tr>
<td>Domino's Express #17</td>
<td>4415 W. Doolin</td>
<td>Blackwell</td>
<td>Public access, C-store location; 24 hours</td>
<td>Quick fill</td>
<td>3600 psi</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Domino's Express #20</td>
<td>416 E. Veterans Memorial Hwy</td>
<td>Blanchard</td>
<td>Public access, C-store location; 24 hours</td>
<td>Quick fill</td>
<td>3600 psi</td>
<td></td>
<td></td>
</tr>
<tr>
<td>High Plains BioEnergy</td>
<td>3300 E. 32nd</td>
<td>Guymon</td>
<td>Public access</td>
<td>Quick fill</td>
<td>3600 psi</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Love's Travel Stop #452</td>
<td>1601 Airline Dr.</td>
<td>Pauls Valley</td>
<td>Public access, C-store location; 24 hours</td>
<td>Quick fill</td>
<td>3600 psi</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Domino's Express #2</td>
<td>401 S. Main</td>
<td>Seiling</td>
<td>Public access, C-store location; 24 hours</td>
<td>Quick fill</td>
<td>3600 psi</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Northeast Oklahoma Public Facilities Authority (NOPFA Stilwell CNG Station)</td>
<td>Hwy 59 N.</td>
<td>Stilwell</td>
<td>Public access; non-attended; 24 hours</td>
<td>Quick fill</td>
<td>3600 psi</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Apache Thackerville</td>
<td>Exit 1, I-35</td>
<td>Thackerville</td>
<td>Public access; non-attended; 24 hours</td>
<td>Quick fill</td>
<td>3600 psi</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Station Name</td>
<td>Address</td>
<td>City</td>
<td>Access Groups</td>
<td>Fill Rate</td>
<td>PSI</td>
<td>Access Method</td>
<td>Contact</td>
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</tr>
<tr>
<td>Love's Travel Stop #255</td>
<td>214 S. Hwy 100</td>
<td>Webber's Falls</td>
<td>Public access, C-store location; 24 hours</td>
<td>Quick fill</td>
<td>3600 psi</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

## Appendix D: Energy Emergency Response Menu

### Electricity Emergency Response Menu

<table>
<thead>
<tr>
<th>Type of Emergency</th>
<th>Supply or Demand Side Management</th>
<th>Measure</th>
<th>What it Does</th>
<th>Recommended Steps</th>
</tr>
</thead>
<tbody>
<tr>
<td>Electric Supply</td>
<td>Supply</td>
<td>Participation in regional planning and transmission organizations (Southwest Power Pool)</td>
<td>SPP can see each generating unit and transmission line and monitors these 24/7/365. OCC PUD maintains staff in active communication with SPP to update on status of shortages. Utilities can also go directly to SPP.</td>
<td>1</td>
</tr>
<tr>
<td>Electric Supply</td>
<td>Supply</td>
<td>Temporarily increase levels of coal stockpiling by electric utility companies.</td>
<td>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.</td>
<td>2</td>
</tr>
</tbody>
</table>

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<table>
<thead>
<tr>
<th>Electric Supply</th>
<th>Temporarily substitute Oklahoma coal for Wyoming coal in coal-fired power plants.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>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.</td>
</tr>
<tr>
<td></td>
<td>Utilities would contact DEQ and U.S. EPA to gain waivers to temporarily substitute one type of coal for another.</td>
</tr>
<tr>
<td>Electric Supply</td>
<td>Reduction of voltage in the system.</td>
</tr>
<tr>
<td></td>
<td>Reduction of voltage by less than five or six percent can reduce the demands on the system, with most customers not being adversely impacted.</td>
</tr>
<tr>
<td></td>
<td>* 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.</td>
</tr>
<tr>
<td></td>
<td>Utilities would notify customers in conjunction with OCC, and then utilities would perform the voltage reduction.</td>
</tr>
<tr>
<td>Electric Supply</td>
<td>Utilize large backup generation when mobile units are available</td>
</tr>
<tr>
<td>-----------------</td>
<td>---------------------------------------------------------------</td>
</tr>
<tr>
<td></td>
<td>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.</td>
</tr>
<tr>
<td></td>
<td>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.</td>
</tr>
</tbody>
</table>

<p>| Electric Supply | Use locomotive generators for electricity generation in selected locations. | Oklahoma has more useable freight rail lines than almost any other state. By utilizing 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. |</p>
<table>
<thead>
<tr>
<th>Electric Natural Gas</th>
<th>Demand</th>
<th>Activate interruptible rates/curtailment programs</th>
<th>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.</th>
<th>All utilities have these programs currently in place and could activate curtailments as needed without state approval. Utilities must provide notice to the individual users prior to curtailing.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Electric</td>
<td>Demand</td>
<td>Implement system-wide rolling blackouts</td>
<td>A load shedding mechanism that allows a utility to reduce the impacts realized from extended outages.</td>
<td>Utility must notify customers and OCC prior to outages beginning and duration of outages must be determined by the utility. Utility must consider if any customers should be exempted from the blackouts. Coordinate with OEM and OCC to disseminate information on blackout locations and duration via media and utilize smart meters as possible to target outage locations.</td>
</tr>
<tr>
<td>Electric</td>
<td>Demand</td>
<td>Voluntary or mandatory curtailment of public building energy use</td>
<td>Load shedding mechanism that could mean reduced hours of operations to curtail energy use.</td>
<td>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.</td>
</tr>
</tbody>
</table>

Page | 121
<p>| Electric Demand | 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 |
| Electric Demand | 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. | 2 |
| Electric Demand | Demand | Implement a public information or incentive program to purchase more efficient appliances, add insulation, or change lighting | A mechanism to reduce energy consumption | Utilities currently offer these incentives. State agencies including OCC and ODOC also promote these incentives to the public. | 1 |
| Electric Demand | 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&amp;E and PSO) can employ these programs without input from state officials. | 4 |
| 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 |
| Electric Demand | Consider using public figures such as OCC Commissioners or Governor for PSAs regarding electricity conservation in times of shortage. | 2 |
| 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 |
| Electric Demand | 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. | The State has no authority over these changes as these are unregulated utilities. | 3 |
| Electric Demand |  |  |  | 4 |</p>
<table>
<thead>
<tr>
<th>Electric</th>
<th>Demand</th>
<th>Encourage or direct government facilities to improve energy efficiency.</th>
<th>Reduces energy consumption</th>
</tr>
</thead>
<tbody>
<tr>
<td>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.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>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.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Shorter term measures could be coordinated through OMES and Governor (Executive Order in an emergency situation).</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>OCC can encourage additional programming at any time.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Directing additional programming would be accomplished through a formal rulemaking process or legislation.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Electric</td>
<td>Demand</td>
<td>Utilize buy-back rates that pay customers to sell excess self-generated electricity back to the grid for utility credit</td>
<td>Reduces the need for utility generation</td>
</tr>
<tr>
<td>---</td>
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</tr>
<tr>
<td>Electric Natural Gas Propane</td>
<td>Demand</td>
<td>Encourage the use of alternative fuels, such as natural gas, propane, diesel or wood as the fuel source for home heating.</td>
<td>Provides alternative heating sources in event of electrical outages</td>
</tr>
</tbody>
</table>
## Petroleum Emergency Response Menu

<table>
<thead>
<tr>
<th>Type of Emergency</th>
<th>Supply or Demand Side Management</th>
<th>Measure</th>
<th>What it Does</th>
<th>Recommended Steps</th>
<th>Recommended for Shortage Level</th>
</tr>
</thead>
<tbody>
<tr>
<td>Petroleum Supply</td>
<td>State of Oklahoma assumes control of fuel prioritization</td>
<td>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. 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.</td>
<td>The Governor’s Office would coordinate with the Corporation Commission and OEM to determine the appropriate prioritization.</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>Petroleum Supply</td>
<td>Temporarily lift Federal Motor Carrier Safety Regulations (FMCSR) restrictions for over the road transport trucks.</td>
<td>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.</td>
<td>A Governor’s Declaration of Emergency automatically lifts FMCSR. See Appendix F. Coordinate with surrounding states to ensure smooth interstate travel of equipment or fuel.</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>4</td>
</tr>
</tbody>
</table>

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53 A NASEO template for model Executive Order language can be found at [http://naseo.org/energyassurance/Guidance_for_States_on_Relief_from_Federal_Motor_Carrier_Safety_Regulations.pdf](http://naseo.org/energyassurance/Guidance_for_States_on_Relief_from_Federal_Motor_Carrier_Safety_Regulations.pdf) (February 14, 2013).

54 Note: Truck size and weight relief is a state-by-state matter, where the Federal Highway
### Petroleum Supply

<table>
<thead>
<tr>
<th>Top off fuel storage tanks in anticipation of an event that will impact gasoline transportation</th>
<th>Private petroleum retailers may choose to do this voluntarily to ensure available supply if a shortage is imminent.</th>
<th>Retailers will monitor potential shortages and act accordingly.</th>
</tr>
</thead>
<tbody>
<tr>
<td>This is currently a common practice for petroleum retailers.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### 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. |

### 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. |

---

Administration (FHWA) is the lead Federal agency.
<table>
<thead>
<tr>
<th>Petroleum</th>
<th>Supply</th>
<th>Request waivers from the U.S. Environmental Protection Agency 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.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Petroleum</td>
<td>Supply</td>
<td>Petition the U.S. Environmental Protection Agency 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. Suspension 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.</td>
</tr>
<tr>
<td>Petroleum</td>
<td>Supply</td>
<td>Petition the U.S. Department of Energy or President for an exchange or release of crude oil from the U.S. Strategic Petroleum Reserve.</td>
</tr>
<tr>
<td>-----------</td>
<td>--------</td>
<td>---------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Petroleum</td>
<td>Demand</td>
<td>Conduct a public information campaign to encourage ridesharing</td>
</tr>
<tr>
<td>Petroleum</td>
<td>Demand</td>
<td>Conduct a public information campaign to encourage efficient driving practices</td>
</tr>
<tr>
<td>Petroleum</td>
<td>Demand</td>
<td>Trigger the Oklahoma Emergency Price Stabilization Act.</td>
</tr>
<tr>
<td>Petroleum</td>
<td>Demand</td>
<td>Offer discounted rates or incentives for utilizing any public transit options.</td>
</tr>
<tr>
<td>-----------</td>
<td>--------</td>
<td>-------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Petroleum</td>
<td>Demand</td>
<td>Increase the number or frequency of bus routes</td>
</tr>
<tr>
<td>Petroleum</td>
<td>Demand</td>
<td>Reduce speed limits on roadways, and/or increase the enforcement of either lowered or existing speed limits.</td>
</tr>
<tr>
<td>Petroleum</td>
<td>Demand</td>
<td>Create a public information campaign encouraging employers to offer telecommute or telework options.</td>
</tr>
<tr>
<td>Petroleum</td>
<td>Demand</td>
<td>Enact/support a telework or telecommute policy for public employees</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Petroleum</th>
<th>Demand</th>
<th>Encourage staggered commute times (commuting off-peak hours or days) for public and/or private employers and/or school start times.</th>
<th>Reduces the amount of transit time in congested areas, and thereby reduces the amount of fuel consumed.</th>
<th>Governor could allow for public employees to utilize flex time. Public officials could encourage the private sector via PSA’s.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Petroleum</td>
<td>Demand</td>
<td>Curtail recreational marine or off-road vehicle use.</td>
<td>Reduces discretionary use of vehicle fuel.</td>
<td>The public safety department or GRDA would enforce curtailments of recreational use.</td>
</tr>
<tr>
<td>Petroleum</td>
<td>Demand</td>
<td>Encourage the use of alternative fuels such as CNG, biofuels, or diesel natural gas, especially in public and school fleets.</td>
<td>Converting a portion of fleets to a secondary fuel source creates a hedge against fuel shortage or emergency.</td>
<td>Department of Commerce SEO, OCC, private utilities, Secretary of Energy, and Governor could all be involved in promoting this initiative.</td>
</tr>
<tr>
<td>Type of Emergency</td>
<td>Supply or Demand Side Management</td>
<td>Measure</td>
<td>What it Does</td>
<td>Recommended Steps</td>
</tr>
<tr>
<td>-------------------</td>
<td>----------------------------------</td>
<td>---------</td>
<td>--------------</td>
<td>------------------</td>
</tr>
<tr>
<td>Natural Gas</td>
<td>Supply</td>
<td>Temporarily lift wellhead restrictions on the production of natural gas.</td>
<td>Allows companies to pump as much gas as possible.</td>
<td>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).</td>
</tr>
<tr>
<td>Natural Gas</td>
<td>Supply</td>
<td>Allow pipeline pack to increase reserve supplies available.</td>
<td>Allows pipeline companies to store additional natural gas in the pipelines. This is generally done in anticipation of elevated demand.</td>
<td>The allowable pipeline pressure increases are regulated by federal law.</td>
</tr>
<tr>
<td>Natural Gas</td>
<td>Supply</td>
<td>Local gas distribution companies (LDC) can purchase additional gas in order to meet demand.</td>
<td>Mainly a preventative measure to be used when shortages can be anticipated — there must be an adequate gas supply available to purchase additional gas. 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.</td>
<td>This activity will be conducted by private gas companies; OCC should remain actively involved in understanding anticipated supply shortages.</td>
</tr>
<tr>
<td>Natural Gas</td>
<td>Supply</td>
<td>Gas companies that are drawing gas from storage facilities can increase the rate of withdrawal.</td>
<td>Helps meet increased short-term demand.</td>
<td>No special permissions needed. Companies make these decisions independently—contractually they may go up to their maximum withdrawal rate without notifying state officials.</td>
</tr>
<tr>
<td>Natural Gas</td>
<td>Supply</td>
<td>Encourage/require gas companies when technically feasible to access and utilize other sources of gas, (LNG, propane air stations, synthetic natural gas plants).</td>
<td>Diversifies fuel sources, decreasing reliance on natural gas.</td>
<td>Would require that conversion equipment exists and the companies would be buying gas “off system.”</td>
</tr>
<tr>
<td>Natural Gas</td>
<td>Demand</td>
<td>Encourage/require a short-term reduction in natural gas usage in state facilities or by industrial users.</td>
<td>Temporarily relieves demand on the natural gas system.</td>
<td>Governor has authority over state facilities. OEM would coordinate communication requirements or encouragement for industrial users. OCC becomes involved if curtailment issues arise.</td>
</tr>
<tr>
<td>-------------</td>
<td>--------</td>
<td>--------------------------------------------------------------------------------------------------</td>
<td>-------------------------------------------------</td>
<td>--------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Natural Gas</td>
<td>Demand</td>
<td>Request that large commercial and industrial customers reduce gas use by decreasing their thermostat settings or reducing gas-consuming industrial processes.</td>
<td>See above.</td>
<td>OCC is involved through interruptible gas rates. Once signed up the utility has the discretion how to execute the curtailment.</td>
</tr>
<tr>
<td>Natural Gas</td>
<td>Demand</td>
<td>Encourage residential customers to lower thermostats and water heating settings and defer using gas appliances</td>
<td>See above.</td>
<td>A utility or the state could issue PSA’s to consumers to encourage their participation.</td>
</tr>
<tr>
<td>Natural Gas</td>
<td>Demand</td>
<td>Curtail or shut off gas supply to customers, regardless of interruptible agreements in place.</td>
<td>Assures reduction in natural gas use for serious shortage situations.</td>
<td>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.</td>
</tr>
<tr>
<td>Natural Gas</td>
<td>Demand</td>
<td>Increase retail rates to consumers.</td>
<td>Higher cost often reduces consumption.</td>
<td>Requires a statutory change and emergency rulemaking.</td>
</tr>
<tr>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td><strong>Natural Gas</strong></td>
<td>Demand</td>
<td>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.</td>
<td>Financial incentive programs are administered at the utility level but are authorized at OCC.</td>
<td></td>
</tr>
<tr>
<td><strong>Natural Gas</strong></td>
<td>Demand</td>
<td>Encourage large industrial natural gas customers to participate in a gas buy-back program.</td>
<td>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.</td>
<td>This would be a transaction in the private sector.</td>
</tr>
</tbody>
</table>
Appendix E: Sperry-Piltz Ice Accumulation 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

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

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

### Weather Conditions and SPIA Index Levels at a Glance:

<table>
<thead>
<tr>
<th>Ice and Wind:</th>
<th>*Average NWS Ice in Inches; Wind in MPH</th>
<th>&lt; 15 mph</th>
<th>15-25 mph</th>
<th>25-35 mph</th>
<th>&gt; = 35 mph</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.10 – 0.25</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>0.25 – 0.50</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>0.50 – 0.75</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>0.75 – 1.00</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>1.00 – 1.50</td>
<td>4</td>
<td>5</td>
<td>5</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>&gt; 1.50</td>
<td>5</td>
<td>5</td>
<td>5</td>
<td>5</td>
<td></td>
</tr>
</tbody>
</table>

Appendix F: Implementation Actions

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

The following are executive orders issued by the Governor in previous emergency situations which lifted Federal Motor Carrier Safety Regulations during an energy emergency. These orders can be used as models for the future and altered to fit the precise circumstances being 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 FMCSR 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 issuing the Executive Order, the National Association of State Energy Officials 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.
EXCLUSIVE 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:

STATE CAPITOL BUILDING • 2300 N. LINCOLN BOULEVARD, SUITE 312 • OKLAHOMA CITY, OKLAHOMA 73105 • (405) 521-2342 • WEB (405) 521-3353

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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 27th day of September, 2012.

BY THE GOVERNOR OF THE STATE OF OKLAHOMA

MARY FALLIN

ATTEST:

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:


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
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

SECRETARY OF STATE
Requesting a Fuels Waiver

In the event of a fuel supply emergency, the U.S. EPA, with the concurrence of the 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, 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 am to 5 pm) the first point of contact for obtaining information about a fuels waiver request is the U.S. EPA 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.

Written fuels waiver requests should be addressed to:

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

http://compliance.supportportal.com/link/portal/23002/23009/Article/32913/-9-What-is-the-procedure-for-formally-requesting-a-fuels-waiver
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.