

# State Energy Security Validation Workshop

New Mexico Energy, Minerals, and Natural Resources Department (EMNRD)  
Energy Conservation and Management Division (ECMD)

N E W M E X I C O



Energy, Minerals and Natural Resources Department

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# Introduction: Energy, Minerals, and Natural Resources Department Energy Conservation and Management Division



Jacqueline Waite

Bureau Chief, Energy Conservation and  
Management Division

# Role of ECMD/New Mexico State Energy Office

- Responsibilities as condition of State Energy Program funding through the U.S. Department of Energy:
  - Monitor energy sectors across the state
  - Promote and implement energy security measures
  - **Maintain** and continually **update** the New Mexico **State Energy Security Plan**
  - Serve as the primary agency for coordinating communications during an energy emergency per ESF #12 (Energy Annex of the New Mexico All-Hazards Emergency Operations Plan)
- Efforts of ECMD to-date:
  - Completed current iteration of State Energy Security Plan in September 2022
  - Contracted with Hagerty Consulting, Inc. for 2023 Plan update
  - Worked with partners to develop two energy security table-top exercises to inform the SESP update:
    - November 2022: Cascading Energy Disruption Tabletop Exercise
    - May 2023: Regional Energy Security Tabletop Exercise
  - Applied for funding under IIJA section 40101 (d) to support implementation of electric grid resilience measures targeting areas with chronic outages and vulnerabilities

# Regional Energy Security Tabletop Exercise in May 2023

To bolster energy preparedness, EMNRD ECMD will host an in-person **Regional Energy Security Tabletop Exercise** at the La Fonda Hotel in **Santa Fe on May 1-2, 2023**.

There are a limited number of spaces, and if you are interested in participating, please contact Jacqueline Waite as soon as possible.

[Jacqueline.Waite@emnrn.gov](mailto:Jacqueline.Waite@emnrn.gov)

# New Mexico's Renewable Energy Transition

- Governor Lujan Grisham signed the **Energy Transition Act** (ETA) into law in March 2019.
- The ETA sets a **statewide renewable energy standard** of 50 percent by 2030 for New Mexico investor-owned utilities and rural electric cooperatives and a goal of 80 percent by 2040, in addition to setting **zero-carbon resources standards** for investor-owned utilities by 2045 and rural electric cooperatives by 2050.
- The law transitions New Mexico away from coal and toward clean energy and provides tens of millions of dollars of economic and workforce support for communities impacted by coal plant closures, as well as the development of renewable replacement power in San Juan County.
- **An objective of the SESP update, as well as the facilitation of this State Energy Security Validation Workshop, is to evaluate energy security needs as the state undertakes a renewable energy transition.**

# Introduction: Hagerty Consulting, Inc.



Katie Toskey

Project Manager



Anthony Hurley

Subject Matter Expert

## Hagerty Consulting, Inc.

Emergency management and homeland security consulting firm with nearly 20 years experience supporting all levels of government and the private sector. Assists clients, like the State of New Mexico, prepare for, respond to, and recover from disasters and other emergencies.



# Introduction and Background

Energy Security Assessment Themes and Prompts

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# State Energy Security

- The energy sector is uniquely critical as **all other critical infrastructure sectors depend on power or fuel to operate**. An impact on critical energy infrastructure can directly affect the security and resilience within and across other critical infrastructure sectors, threatening public safety, the economy, and national security.
- Our nation's energy infrastructure and delivery systems are vulnerable to a variety of threats and hazards, including severe weather (exacerbated by climate change), cyberattacks, system failures, pandemics, and deliberate physical attacks.
- **Most of the nation's critical infrastructure is owned and operated by private companies**. Both the government and private sector have a **mutual incentive** to reduce the risk of disruptions to critical infrastructure.
- It is the **responsibility of state and local officials to work with energy providers, across government agencies and with relevant stakeholders** to reduce the risk, vulnerabilities, and consequences of an energy disruption or emergency and provide for rapid recovery.



# State Energy Security Plans

- State Energy Security Plans (SESPs) are an **essential part of energy security planning**.
- An SESP describes the state's energy landscape, people, processes, as well as the state's strategy to build energy resilience.
- Critical details included describe how a state, working with energy partners, can:
  - Secure energy infrastructure against all physical and cybersecurity threats;
  - Mitigate the risk of energy supply disruptions to the state;
  - Enhance the response to, and recovery from, energy disruptions; and
  - Ensure that the state has secure, reliable, and resilient energy infrastructure.
- The purpose of this initiative is to **update New Mexico's SESP** to reflect **new criteria outlined Section 40108 of the Infrastructure Investment and Jobs Act (IIJA)**.

# New Criteria for State Energy Security Plans

- The updated SESP will **fulfill all requirements identified in Section 40108 of the IIJA**, including:
  - Addressment of all energy sources and regulated and unregulated energy providers;
  - Provision of a state energy profile, including an assessment of energy production, transmission, distribution, and end-use;
  - Addressment of potential hazards to each energy sector or system, including physical threats and vulnerabilities and cybersecurity threats and vulnerabilities;
  - Provision of a risk assessment of energy infrastructure and cross-sector independencies;
  - A risk mitigation approach to enhance reliability and end-use resilience; and
  - Addressment of multi-state and regional coordination, planning, and response and coordination with Tribal governments with respect to planning and response.

# Stakeholder Engagement

- Stakeholder engagement and collaboration is a **priority of the project**.
- Successful execution and completion of this undertaking requires partnership with a range of stakeholders across New Mexico and the southwest region.
- EMNRD ECMD understands the sensitive nature of information that may be shared by stakeholders throughout this initiative and remains committed to serving as the utmost trusted and reliable partner.
- Public-private collaboration is valued and EMNRD ECMD will work thoughtfully and meaningfully to streamline communications throughout the entirety of this initiative to prioritize necessary participation, particularly for stakeholders who are involved in multiple state projects concurrently.

# Completed Project Activities

- **Email outreach to stakeholder groups** including energy sector industry representatives, critical infrastructure, government, and associations was delivered on November 9 to introduce the project.
- A virtual **Stakeholder Kickoff Meeting** was hosted on November 16.
- Over the past three months, the project team has developed the following deliverables which will be incorporated into the updated SESP:
  - State Energy Profile
  - Threats and Vulnerabilities Inventory
  - Energy Critical Infrastructure and Cross-Sector Interdependencies Risk Assessment
- Deliverables have been written in accordance **with guidance for SESP's issued by the U.S. Department of Energy's (DOE) Office of Cybersecurity, Energy Security, and Emergency Response (CESER)** in collaboration with associations such as the National Association of State Energy Offices.

# State Energy Profile

- The State Energy Profile provides **baseline data, maps, and other information on state markets and infrastructure for all energy sources** (electricity, liquid fuels, and natural gas) including:
  - Production: in-state energy production, including electricity generation by fuel and oil and gas upstream production and refining and processing
  - Transmission: interstate energy transfers and imports, including information on major pipelines, transmission lines, and rail infrastructure
  - Distribution: overview of energy providers in the state, including electric utilities, natural gas local distribution companies, and liquid fuels terminal operators and fuel distributors
  - End-Use: energy demands, including information on seasonal and intraday variability, demands by sector, and state-specific fuel specifications

# Threats and Vulnerabilities Inventory

- The Threats and Vulnerabilities Inventory **plots threats and vulnerabilities in each energy sector against their impact and likelihood in the state and region.**
- **Threat** information includes anything that can expose a vulnerability and damage, destroy, or disrupt energy systems, including natural, technological, manmade, physical, and cybersecurity hazards.
- **Vulnerabilities** are weaknesses within infrastructure, processes, and systems, or the degree of susceptibility to various threats. Vulnerabilities may be specific to the threat, energy type, and infrastructure component.

# Energy Infrastructure and Cross-Sector Interdependencies Risk Assessment

- The Energy Infrastructure and Cross-Sector Interdependencies Risk Assessment:
  - Addresses the risk of potential for loss, damage, or destruction of key resources or energy system assets resulting from exposure to a threat.
  - Considers the consequence of an asset's loss, the vulnerability of an asset to specific threats, and the likelihood that an asset will be exposed to a specific threat.
  - Describes interdependencies between the energy sector and other sectors and between different energy sub-sectors (electricity, liquid fuels, and natural gas) to understand the interconnected nature of energy infrastructure and the possible cascading impacts of a disruption.
- Knowing how susceptible an energy asset is to a disruption (natural or manmade) allows EMNRD ECMD to **focus mitigation resources and strategies on better protecting the most vulnerable assets.**

# State Energy Security Validation Workshop

The **purpose** of today's workshop is to **review key themes** identified within the New Mexico energy sector profile, in addition to critical infrastructure, threats and vulnerabilities, and cross-sector interdependencies, and **obtain stakeholder guidance and perspectives** that will enhance the updated SESP with information that most accurately portrays the state's energy landscape.





Introduction and Background

**Energy Security Assessment Themes and Prompts**

Next Steps

# Critical Infrastructure



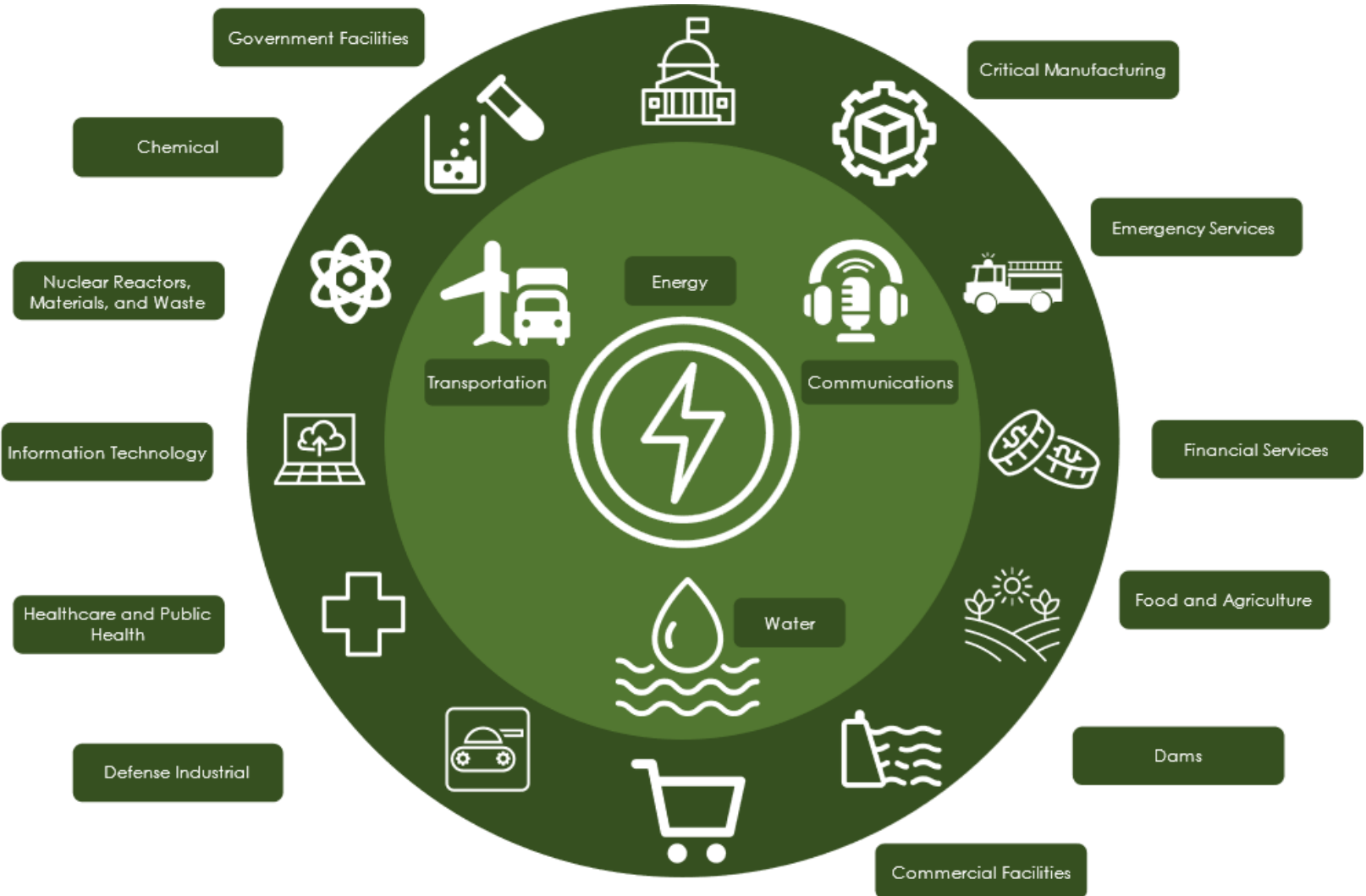
# Critical Infrastructure

- The US DHS Cybersecurity and Infrastructure Security Agency (CISA) outlines **16 critical infrastructure sectors** whose assets, systems, and networks, whether physical or virtual, are considered so vital to the United States that their incapacitation or destruction would have a debilitating effect on security, national economic security, national public health or safety, or any combination thereof.
- The same definition can be applied to state assets, systems and networks that are considered vital to New Mexico.
- **Critical energy infrastructure is defined as physical or virtual energy systems and assets so vital that the incapacity or destruction of such systems and assets would have a debilitating impact on national security, economic security, public health or safety, or any combination of those matters.**
- **Energy is the backbone of all other critical infrastructure systems**, meaning that an energy supply failure could have cascading effects on other sectors.

## CISA Critical Infrastructure Sectors:

- Chemical
- Commercial Facilities
- Communications
- Critical Manufacturing
- Dams
- Defense Industrial Base
- Emergency Services
- Energy
- Financial Services
- Food and Agriculture
- Government Facilities
- Healthcare and Public Health
- Information Technology
- Nuclear Reactors, Materials, and Waste
- Transportation Systems
- Water and Wastewater Systems

# Critical Infrastructure



# Electricity Sector Critical Infrastructure New Mexico

- New Mexico hosts **125 power plants**, and the five largest generating units include: Four Corners, Hobbs Generating Stations, Luna Energy Facility, Sagamore Wind, and San Juan.
- Electricity providers include **three investor-owned electric utilities, seven municipal and tribal utilities, and sixteen electric cooperatives.**
- **A critical transmission path** includes **pairs of high voltage** transmission lines originating at the San Juan and Four Corners generating stations in the northwest corner of the state.
- **Investor-owned utilities** maintain responsibility for service territories which may include rural areas where electricity is transported long distances creating vulnerabilities in delivery to the communities served. Within rural communities, smaller populations equate to less resources to support the cost of modernizing and updating infrastructure.
- Customers in New Mexico consume more electricity in **the winter and summer** compared to the spring and autumn.
- Peak electricity usage occurs in **June, July, and August, and there is a spike in usage in December and January.**

## New Mexico's electricity sector customers:

- Residential (85%)
- Commercial (15%)
- Industrial (<1%)
- Transportation (<1%)

## Customer consumption:

- Commercial (38%)
- Industrial (34%)
- Residential (28%)
- Transportation (<1%)

# Natural Gas and Propane Sector Critical Infrastructure in New Mexico

- The natural gas and propane sectors are comprised of three segments: **production and processing, transmission and storage, and distribution.**
- As of **2018**, New Mexico had:
  - 6,440 miles of natural gas transmission pipelines
  - 14,347 miles of natural gas distribution pipelines.
  - 24 natural gas processing facilities
- Natural gas production wells are numerous and widespread, largely through the San Juan Basin and Permian Basin.
- **Pipelines run through the Navajo Nation, the Ute Mountain Ute Reservation, the Pueblo of Laguna, and the Pueblo of Acoma** requiring coordination by multiple jurisdictions.

## New Mexico's natural gas sector customers:

- Residential (92%)
- Commercial (8%)
- Industrial (<1%)
- Transportation (<1%)
- Electric Power (<1%)

## Customer consumption:

- Electric Power (61%)
- Residential (17%)
- Commercial (13%)
- Industrial (9%)
- Transportation (<1%)

# Petroleum Sector Critical Infrastructure in New Mexico

- The petroleum sector is comprised of **upstream** (exploration and production), **midstream** (processing and wholesale distribution), and **downstream** (retail distribution) segments.
- As of **2018**, New Mexico had:
  - 2,055 miles of crude oil pipelines
  - 2,164 miles of refined product pipelines
  - 2 petroleum refineries (one remaining as of 2023)
- The petroleum sector's **upstream infrastructure is concentrated in the Permian Basin in southeastern New Mexico with a small portion from the San Juan Basin in northeastern New Mexico.**
- Supplies of processed petroleum-based products (gasoline, diesel fuel, aviation fuel) are dependent upon imports from other states. **Three major pipelines transport oil products within the state and only one of these pipelines originates within state boundaries.**

# Stakeholder Feedback: Critical Infrastructure

- 1) Based upon your experience, do you agree with the critical infrastructure components included?  
Are there any that should be added or removed to accurately reflect assets within the state?
- 2) Are there energy corridors that the State Energy Office should identify as part of the SESP update?
- 3) Are there any additional considerations the State Energy Office should bear in mind for critical infrastructure, particularly as it relates to the state's renewable energy transition?





# Threats and Vulnerabilities

# U.S. Department of Energy Definitions

## Threats

Threats include anything that can expose a vulnerability and damage, destroy, or disrupt energy systems, including natural, technological, manmade, physical, and cybersecurity hazards.

## Vulnerabilities

Vulnerabilities are weaknesses within infrastructure, processes, and systems, or the degree of susceptibility to various threats. Vulnerabilities may be specific to the threat, energy type, and infrastructure component.

# Threats to New Mexico's Energy Sector

- According to the U.S. Department of Energy, the **natural hazards that caused the greatest overall property damage in New Mexico between 2009 – 2019 include:**
  - **Winter Storms and Extreme Cold** (21 events costing \$39 million)
  - **Wildfire** (5 events costing \$7 million)
  - **Flood** (33 events costing \$6 million)
  - **Thunderstorm and Lightning** (113 events costing \$6 million)
  - **Tornado** (9 events costing \$1 million)
  - **Drought** (16 events costing \$0)
  - **Earthquake (> \$3.5M)** (2 events costing \$0)
  - **Extreme Heat** (1 event costing \$0)
- Additional threats to energy infrastructure include **asset age, corrosion, material failures, equipment failures, outside forces, excavation damage, incorrect operation, derailment or collision, physical security attacks, and cybersecurity attacks.**

# Natural Gas and Propane Sector Threats

- Within New Mexico, the U.S. Department of Energy has identified the following threats to New Mexico's natural gas sector:
  - **Corrosion** (when transported by transmission pipelines) (fourth leading cause nationwide)
  - **Outside Forces** (when transported by distribution pipelines) (leading cause nationwide)
  - **Asset Age**
  - **Cybersecurity Attacks**
  - **Severe Weather**
- 69% of New Mexico's 6,440-mile transmission system and 42% of New Mexico's 14,347-mile distribution system **were constructed prior to 1970 or in an unknown year.**
- Top events affecting natural gas transmission include: **1) Corrosion (\$3.4M per year); 2) Outside Force (\$156K per year); and Equipment Failure (\$73K per year)**
- Top events affecting natural gas distribution include: **1) Outside Force (\$1.02M per year); 2) Material/Weld Failure (\$299K per year); and Incorrect Operation (\$44M per year)**

# Petroleum Sector Threats

- Within New Mexico, the U.S. Department of Energy has identified the following threats to New Mexico's petroleum sector:
  - **Outside Forces** when transported by truck (second leading cause nationwide)
  - **Materials Failures** when transported by rail (fifth leading cause nationwide)
  - **Equipment Failures** when transported by crude oil pipeline (eighth leading cause nationwide)
  - **Corrosion** when transported by product pipelines (second leading cause nationwide)
  - **Disruptions in Other States Impacting Supply**
  - **Cybersecurity Attacks**
  - **Severe Weather**
- 45% of New Mexico's petroleum pipeline systems were **constructed prior to 1970 or in an unknown year.**
- New Mexico has two petroleum refineries, and the leading causes of disruptions include:
  - **General Outages, Repairs, Closures** (third leading cause nationwide)
  - **Loss of Containment or Flaring** (leading cause nationwide)
  - **Maintenance** (second leading cause nationwide)

# Extreme Heat and Cold

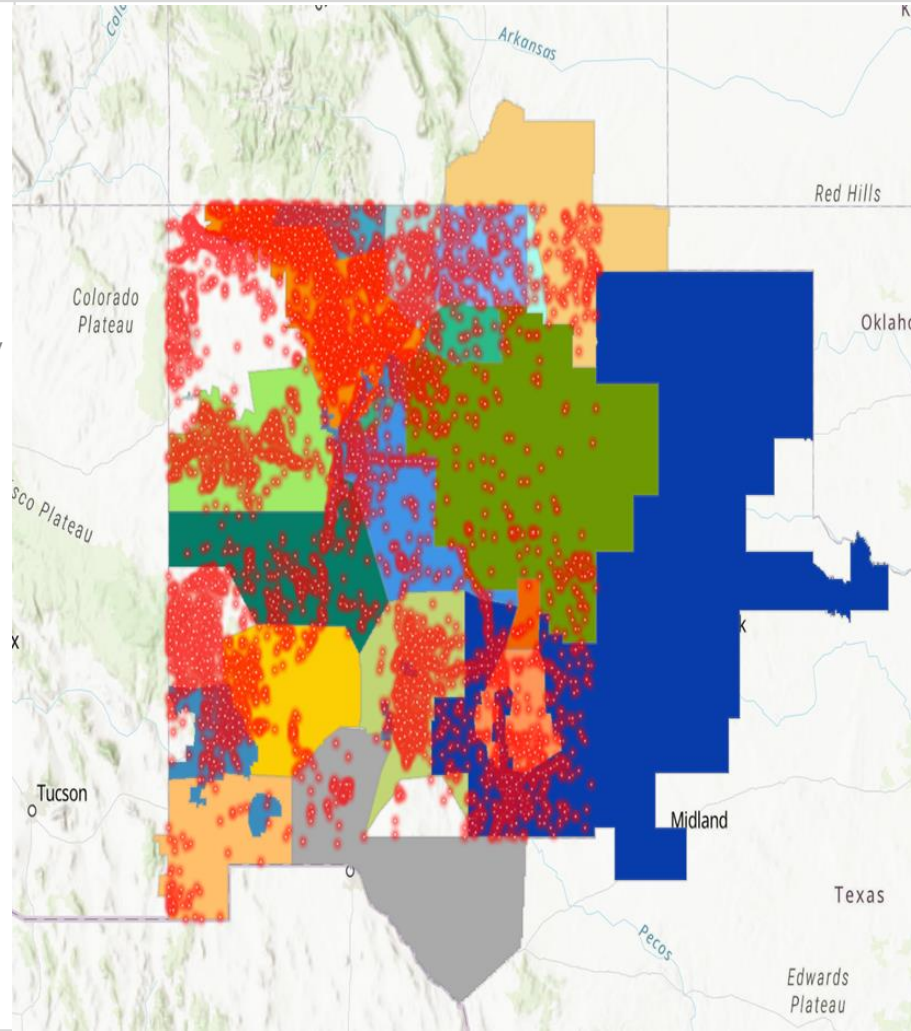
- Extreme heat and cold events place **high strain on the state's energy grid**. Heat waves increase the demand for air conditioning, and cold weather increases the demand for heat.
- Winter storms pose major risks to electric infrastructure when lines become heavy with ice, trees fall, temporary closures of railroads and roadways occur, and physical accidents damage poles and facilities. This cascading impact slows the overall ability to move and provide energy resources and can force additional strain on greater energy infrastructure.
  - In February 2011, the **Groundhog Day Blizzard** created two feet of snow throughout the state and resulted in a State of Emergency due to the failure of the El Paso Electric Company's power grid.
- Climate change continues to drive temperatures higher for longer periods.
- **New Mexico is identified as a state at greatest risk of extreme heat**, particularly densely populated locations such as Albuquerque, Santa Fe, and Las Cruces.
  - In **summer 2022**, high temperatures pushed portions of New Mexico's grid close to requiring rolling blackouts.

# Historical Wildfires and Electricity Providers

## Electric Utility Territories and Historical Wildfires

### LEGEND:

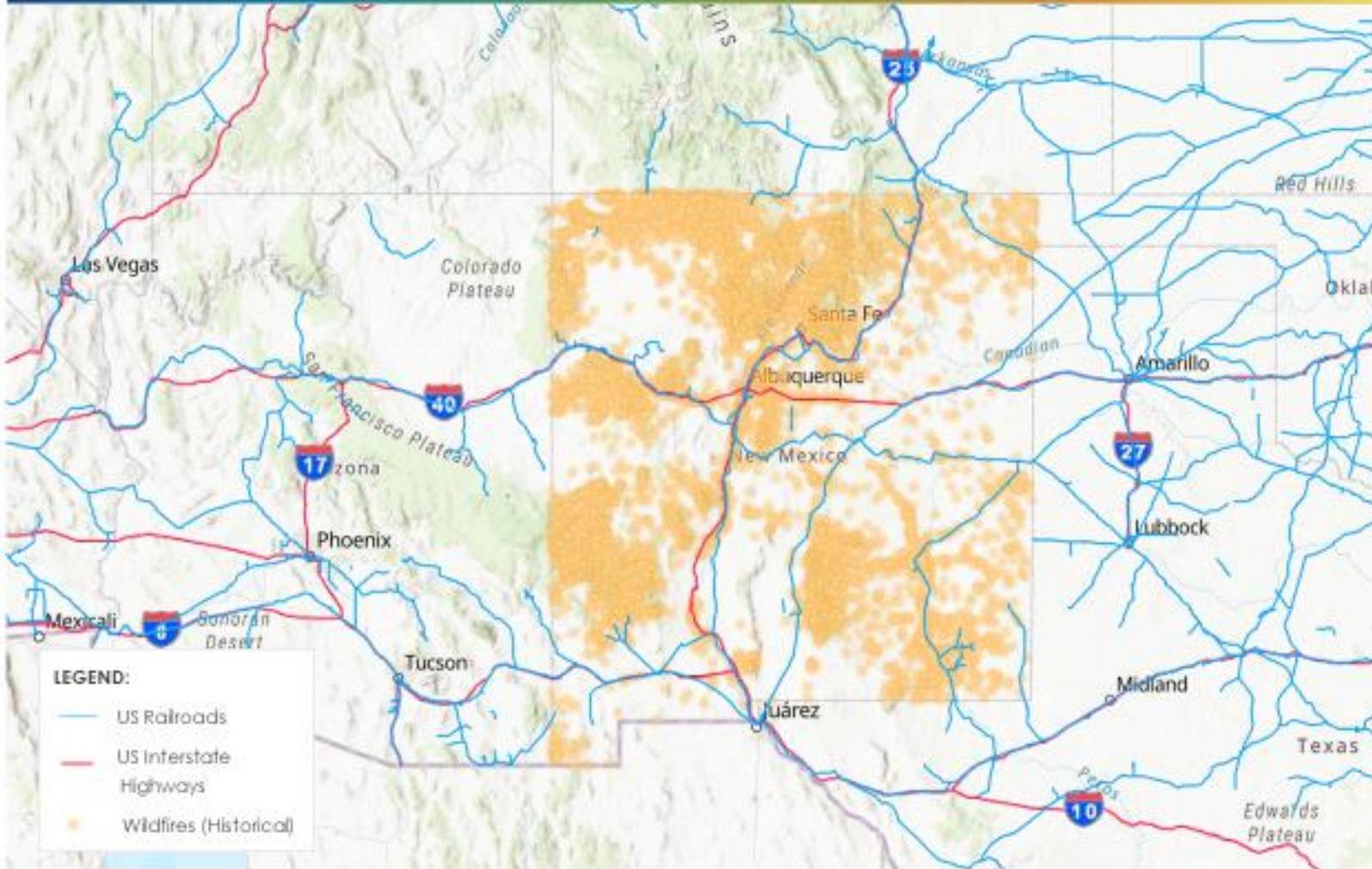
- |   |  |
|---|--|
| ● Central New Mexico Electric Coop, Inc | ● Los Alamos County                      |
| ● Central Valley Electric Coop, Inc     | ● Mora-San Miguel Electric Coop          |
| ● City of Aztec – (NM)                  | ● Northern Rio Arriba E Coop, Inc        |
| ● City of Farmington – (NM)             | ● Otero County Electric Coop, Inc        |
| ● City of Gallup - (NM)                 | ● Public Service Company of New Mexico   |
| ● City of Truth or Consequences – (NM)  | ● Raton Public Service Company           |
| ● Columbus Electric Coop, Inc           | ● Southwestern Public Service Company    |
| ● Continental Divide Electric Coop, Inc | ● Roosevelt County Electric Coop, Inc    |
| ● El Paso Electric Coop                 | ● Sierra Electric Coop, Inc              |
| ● Farmers Electric Coop, Inc – (NM)     | ● Socorro Electric Coop, Inc             |
| ● Jemez Mountains Electric Coop, Inc    | ● Southwestern Electric Coop, Inc - (NM) |
| ● Kit Carson Electric Coop, Inc         | ● Springer Electric Coop, Inc            |
| ●                                       | ● Town of Springer – (NM)                |



- The 2022 wildfire season in New Mexico was the **most expensive in recent history** costing \$65 million dollars by May. It included 40 wildfires and burned a total of 904,000 acres. The fires were linked to lightning strikes, human-caused events, and downed power lines.
- Increased drought, stronger winds, and more frequent lightning associated with higher temperatures directly correlate to the increased potential of wildfires and **greater threat to energy infrastructure** through destabilization of transmission lines and roadways.

# Historical Wildfires and Transportation

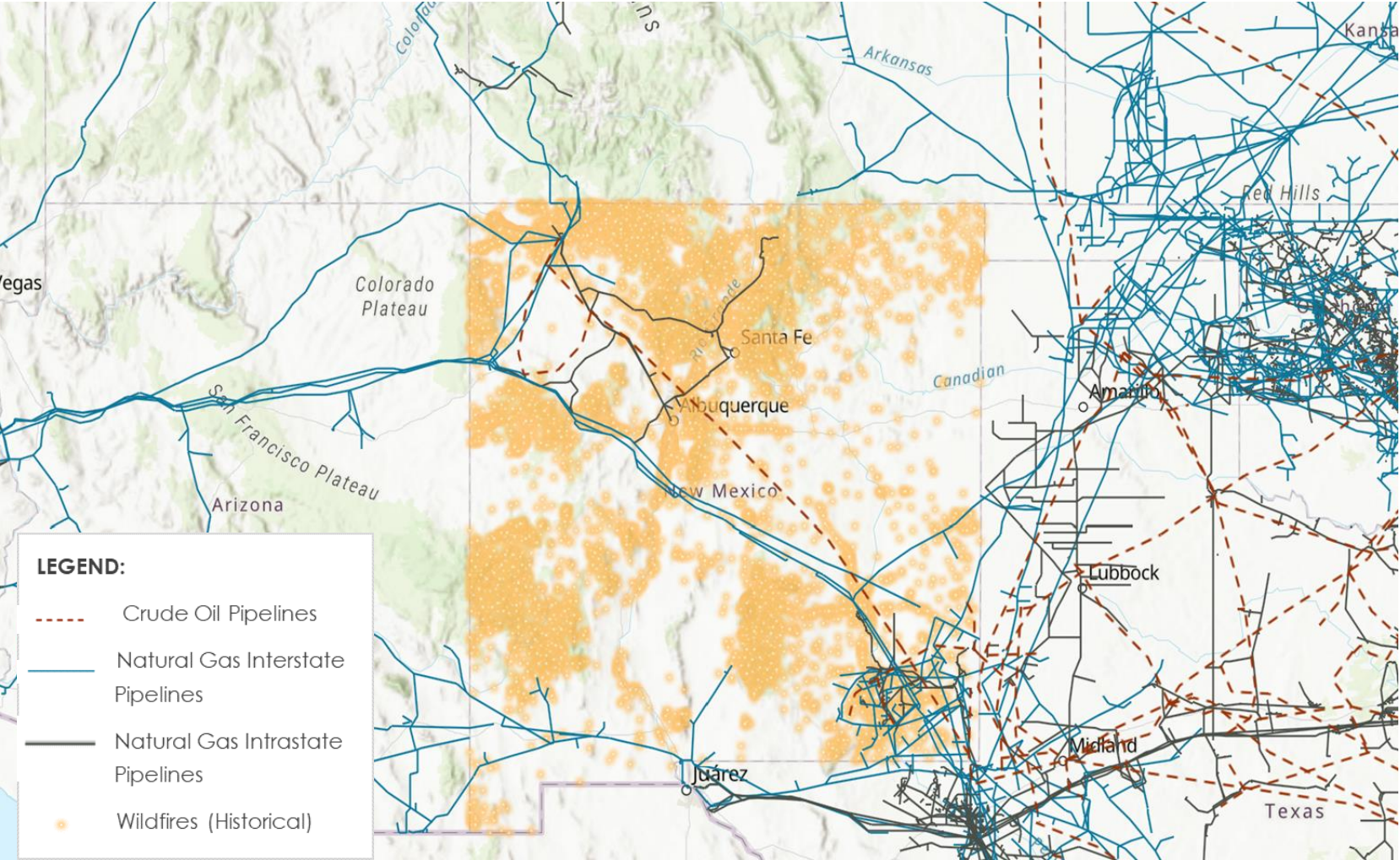
## Historical Wildfires and US Highways/Railroads



- Natural gas, petroleum, and coal play an essential role in electricity generation and currently fuel most of New Mexico's electricity generators.
- Wildfires threaten the transportation and delivery of fuels to power plants.



# Historical Wildfires and Pipelines



- Wildfires pose a threat to natural gas and crude oil pipelines which could adversely impact the generation of electricity in New Mexico.

# Physical Security

- Attacks and suspicious activity at power stations reached a **decade-long high last year**, with more than 100 reported incidents in the first eight months of 2022 according to the U.S. Department of Energy's most recent data.
- Since then, there have been at least **18 more publicly reported attacks** or potential attacks on substations and power plants in Florida, North Carolina, Oregon, South Carolina, and Washington.
- **In April 2022, the Western Electricity Coordinating Council reported a threat of suspicious activity at a facility in San Juan County.**

# Cybersecurity

- The energy sector is **technology driven**.
- Energy systems utilize computing technologies to **manage business systems and control and monitor the processes and transportation of energy** from production and generation to end use.
- The energy sector relies heavily on both **information technology (IT) systems and operational technology (OT) systems**.
  - **Impacts to IT systems:** loss of personally identifiable information, loss of business data, customer/supplier payment issues, and brand damage.
  - **Impact to OT systems:** supply shortfalls, disruption to power and access to fuel, health, safety, and economic impacts, forced switch to manual operations, and loss of visibility into operations.
- The cascading impacts of a cybersecurity attack on energy infrastructure critically threatens the economy and national security because all critical infrastructure sectors rely upon energy to operate.
- The **2022 Annual Threat Assessment** released by the Office of the Director of National Intelligence emphasizes, as it has in the past, **that cyber threats from nation states remain acute**.

# Cybersecurity Threat Actors

## CYBER THREAT ACTORS

A participant in an action or process that is characterized by malice or hostile action using computers, devices, systems, or networks.

### CYBERCRIMINALS

Largely profit-driven and represent a long-term, global, and common threat.



### INSIDERS

Current or former employees, contractors, or other partners who have access to an organization's networks, systems, or data.



### NATION-STATE

Actors aggressively target and gain persistent access to public and private sector networks to compromise, steal, change, or destroy information.



### HACKTIVISTS

Politically, socially, or ideologically motivated and target victims for publicity or to effect change, which can result in high profile operations.



### TERRORIST ORGANIZATIONS








Their limited offensive cyber activity is typically disruptive or harassing in nature.



# Cyber Attack Types

## CYBER ATTACK TYPES

An attack targeting an enterprise's use of cyberspace for the purpose of disrupting, disabling, or maliciously controlling a computing environment/infrastructure, or destroying the integrity of the data or stealing controlled information.

 <h3>SOCIAL ENGINEERING</h3> <p>The use of deception to manipulate individuals into divulging confidential or personal information that may be used for fraudulent purposes.</p>	 <h3>MALWARE</h3> <p>A computer program that is covertly placed onto a computer or electronic device with the intent to compromise the confidentiality, integrity, or availability of data, applications, or operating systems.</p>
 <h3>DENIAL OF SERVICE</h3> <p>Overloading a system through continual resource usage, that prevents legitimate use. Distributed Denial of Service attacks often use "botnets" or "Zombies" to scale an attack.</p>	 <h3>VIRUSES AND WORMS</h3> <p>Introduction of self-propagating or initiated malware into a system through methods such as malicious email attachments, USBs, etc. that seeks to monitor, access, delete, or alter data for nefarious use.</p>
 <h3>PENETRATION ATTACKS</h3> <p>The use of legitimate, publicly available resources on the Internet to check for servers, open ports, and other information that may allow unintended access into the system.</p>	 <h3>TROJANS</h3> <p>Malware which allows "back door" access into a system. This allows an attacker to have a longer reconnaissance through continual check-ins.</p>
	 <h3>RANSOMWARE</h3> <p>Maliciously locking up data or systems and demanding payment of a fee (ransom) or other concessions to unlock the data or systems.</p>

# Energy Sector Vulnerabilities

- The U.S. Department of Energy has identified **human-caused events and asset health** as the great vulnerabilities to New Mexico's energy sector.
- **Human Caused Events:**
  - Insufficient staff who are trained to complete jobs, disputes between staff and employers, impacts from extreme weather limiting the availability of personnel able to report to facilities.
  - Workplace accidents cause physical damage to infrastructure and injure personnel.
- **Asset Health:**
  - Accidents and damage to roadways and railways can slow or stop delivery of materials, resources, and personnel.
    - According to the U.S. Department of Energy, since 1986, outside influences and collisions to trucks transporting liquid fuels have netted a loss of 2.96 million dollars per year on average in New Mexico.
  - Transmission and distribution assets (substation and transformers) currently have long lead times for delivery due to supply chain issues and are expensive to keep as spares.
  - Not all transmission and distribution systems have the same design parameters so equipment may require customized manufacturing.
  - Downed power lines due to pole failure and physical accidents can interrupt telecommunications.

# Stakeholder Feedback: Threats and Vulnerabilities

- 1) Of the threats and vulnerabilities identified, is there one that concerns your organization most?
- 2) Are there any emerging threats that you are integrating onto your organization's emergency planning?
- 3) Are there any private organizations (consider the sixteen critical infrastructure sectors) that you would like to develop a better relationship with to address any of the threats identified?
- 4) Do you have any concerns associated with threats that are associated with neighboring states (Arizona, Utah, Colorado, Oklahoma, and Texas), and Mexico?



# Cross-Sector Interdependencies



# Electricity – Fuel Interdependencies

- **Electrical generation is dependent upon fuel sources while the production and processing of fuel requires electricity.**
- **Examples include:**
  - Natural gas, propane, and petroleum processing and transportation systems may not have sufficient backup electrical power systems to maintain production during prolonged outages. Compressor stations, pumps, and safety monitoring equipment are examples of equipment that require electricity to operate.
  - Most backup electrical power systems require fuel (propane, gasoline, and natural gas).
  - Vehicles that run on gasoline and diesel fuel are essential to the transportation of material and personnel to operate the electric system.
  - Coal, though declining in use, provides a third of electricity currently, and is highly dependent on petroleum-based fuels for its extraction and transportation. Rail transport is particularly important.

# Electricity – Fuel Interdependencies (Cont.)

- Wind and solar plants provide power when there is sufficient wind or insolation, yet require electrical power for system control, monitoring, and communications. Electricity is also needed for restart after shutdown.
- Control systems, critical to energy system production and operation, require a constant source of power to maintain operations along with internet or wireless communications.

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Examples of cascading failures related to this interdependency are the winter freeze events of 2011 and 2021. Prolonged extreme cold weather caused the loss of natural gas supply which also resulted in the reduction in capacity or shut-down of some natural gas-fired electrical generation plants. The resulting instability of the electrical grid, due to excessive demand and insufficient supply, led to load shedding of sections of the grid. These electricity shortfalls further affected natural gas production thus creating a cascading failure of both energy sectors.

# Liquid Fuels – Physical Infrastructure Interdependencies

- Transporting energy products like liquid fuels can be particularly vulnerable to human-caused and natural hazards.
- **Examples include:**
  - Liquid fuel transportation is dependent on both roadways and railways, as well as the wide network of pipelines across New Mexico. Severe weather events can create challenges in which conditions impact the ability to transport liquid fuels in and out of the state.
  - Challenges to transport may cause negative cascading impacts including economic and supply chain issues. There are also potential environmental hazards if spills are associated with failed infrastructure.
  - Physical infrastructure relies on liquid fuels to power vehicles, provide electricity, and run equipment.

# Transportation – Fuel Interdependencies

- **Successful transportation of fuel from sources to generators is critical. Fuel is necessary to operate trucks and rail services.**
- **Examples include:**
  - Transporting liquid fuels, coal, and natural gas from their origination point to generating plants is essential for power generation. Some electricity providers in New Mexico provide electricity to end users in other states making reliable transportation critically important to in-state and regional end users.
  - Petroleum fuel shortages adversely impact the ability of rail and truck to transport fuels.

# Natural Gas – Physical Infrastructure Interdependencies

- **Natural gas pipelines often overlap with physical infrastructure such as roadways, bridges, and facilities and damage to physical infrastructure may impact transmission and distribution.**
- **Examples include:**
  - Damage, corrosion, or failure of physical infrastructure that natural gas pipelines are dependent on may cause interruption or failure of natural gas service and transmission across the state and region.
  - The natural gas sector in New Mexico relies on 6,440 miles of natural gas transmission pipelines and 14,347 miles of distribution pipelines. The largest impact to natural gas supply is corrosion, with an estimated 3.4 million in annual economic loss.

# Stakeholder Feedback: Cross-Sector Interdependencies

- 1) Of the cross-sector interdependencies included, is there one that is most prominent to your organization?
- 2) Are there any additional interdependencies that should be evaluated during the update to New Mexico's SESP?
- 3) What consideration should the State Energy Office address for cross-sector interdependencies during the renewable energy transition?
- 4) Are there state resources that are necessary for addressing cross-sector interdependencies during the renewable energy transition?

# Preparedness Activities



# Preparedness Activities

- **Emergency operations plans.**
- **Training and exercises.**
- Participation in the industry **mutual aid protocols** that foster the sharing of essential equipment between utilities, including personnel.
- Participation in U.S. Department of Energy, American Public Power Association, National Association or Rural Electric Cooperatives, National Association of Regulatory Utility Commissioners, and Edison Electric **cybersecurity resources.**
- Participation in the **Electricity Information Sharing and Analysis Center (E-ISAC).**
- Participation in the **Multi-State Information Sharing and Analysis Center (MS-ISAC).**
- **Fusion center practices** may include bi-directional information sharing with the sector, briefings, or other outreach
- Integration into **state and regional emergency disruption planning and response.**



# Stakeholder Feedback: Preparedness Activities

- 1) What energy emergency preparedness activities does your organization undertake?
- 2) Are there resources or activities that would be helpful for the State Energy Office to direct to integrate public-private partnership for energy emergency preparedness?



Introduction and Background

Energy Security Assessment Themes and Prompts

**Next Steps**

# SESP Development

- SESP development will include the following activities:
  - **Two 90-minute virtual sessions with an Emergency Response Working Group (ERWG) comprised of state, regional and tribal stakeholders**
  - **Two 90-minute virtual sessions with a Resilience and Mitigation Working Group (RMWG) comprised of energy infrastructure owners and operators**
  - Writing of the updated and final SESP

# Emergency Response Working Group

- Timeframe: April 4 and 18, 2023
- Comprised of **state, regional and tribal stakeholders**
- Address:
  - energy security priorities
  - mutual assistance in cyber and physical response plans
  - planning and response responsibilities
  - coordination between state, local, and tribal entities, and wider public-private coordination
- Yield: Integrated Preparedness Plan (IPP) reflecting energy priorities for ERWG stakeholders, existing processes and capabilities, identified next steps for continued capability growth. IPP will be included in the final updated SESP.

# Resilience and Mitigation Working Group

- Timeframe: April 6 and 20, 2023
- Comprised of **energy infrastructure owners and operators**
- Address:
  - Existing, anticipated, and required mitigation initiatives
  - Potential opportunities for additional or collaborative mitigation priorities
  - Public-private partnership to maintain energy reliability, secure infrastructure, and further invest in infrastructure
- The Energy Infrastructure and Cross-Sector Interdependencies Risk Assessment will be utilized to elicit conversation during these discussions
- Yield: Risk Mitigation Approach for inclusion into the updated and final SESP

# SESP Stakeholder Presentations

- Timeframe: June 26 and 27, 2023
- Deliver a two-hour SESP Stakeholder Presentation describing the updated and final SESP to two separate audiences:
  - **SESP Planning Team and government stakeholders**
  - **External stakeholders identified by EMNRD ECMD**
- The presentation will be interactive and may be delivered virtually or in-person
- The presentations will be divided into three portions:
  - State Energy Profile
  - Hazards, Risks, and Mitigation
  - Emergency Response

# Stakeholder Key Dates

April 4, 18, 2023:

**Emergency Response Working Group Meetings** (local, state, regional tribal stakeholders)

April 6, 20, 2023:

**Resilience and Mitigation Working Group Meetings** (energy infrastructure owners and operators)

May 1-2, 2023:

**Regional Energy Security Exercise** (please email Jacqueline Waite if interested)

June 26, 27, 2023:

**SESP Stakeholder Presentations** (government and other stakeholders identified by EMNRD ECMD)

A grayscale landscape photograph of sand dunes and mountains. The word "Questions" is overlaid in a large, bold, blue font. The background shows rolling sand dunes in the foreground, with a person standing on a dune in the middle ground, and a range of mountains in the distance under a clear sky. The overall tone is serene and contemplative.

# Questions



# Project Team



Jacqueline Waite

Bureau Chief, ECMD

[Jacqueline.Waite@emnrd.nm.gov](mailto:Jacqueline.Waite@emnrd.nm.gov)



Katie Toskey

Project Manager

[Katie.Toskey@hagertyconsulting.com](mailto:Katie.Toskey@hagertyconsulting.com)