

U.S. DEPARTMENT OF
ENERGY

OFFICE OF
Cybersecurity, Energy Security,
and Emergency Response

Emergency Support Function #12

Don Ferguson, PhD (ESF12 Regional Coordinator – Region VII)



National Response Framework

In a major disaster, the resources and expertise of Federal departments and agencies are deployed to provide State and local governments with support during disaster response and recovery.

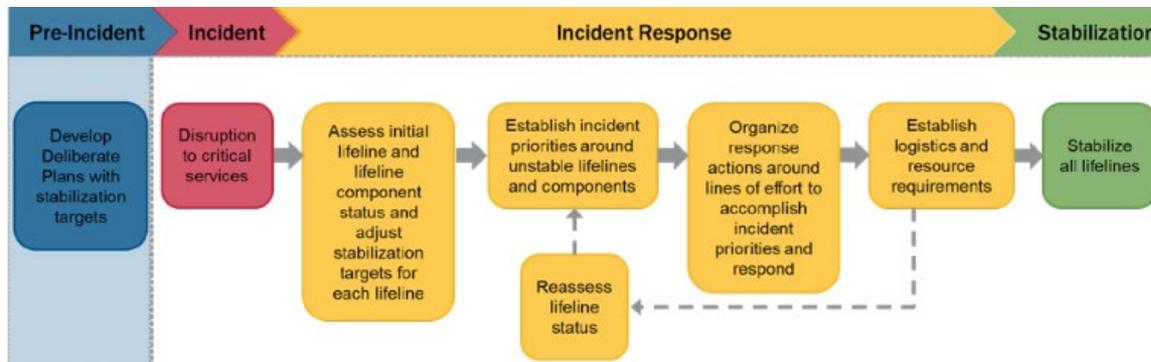
- The NRF provides foundational emergency management doctrine for how the Nation responds to all types of incidents.
 - Scalable, flexible and adaptable
 - Highlights the importance of sustaining essential community lifelines.
- Community Lifelines - services that enable the continuous operation of critical government and business functions and are essential to human health and safety or economic security.



Prioritized Stabilization of Community Lifelines

Stabilizing community lifelines is the primary effort during response to lessen threats and hazards to public health and safety, the economy, and security.

- Community lifelines represent only the most basic services a community relies on and which, when stable, enable all other activity within a community
 - Reframe incident information to provide decision makers with root cause and impact analysis.
- Emergency Support Functions (ESFs) deliver core capabilities to stabilize community lifelines for an effective response



The Application of Community Lifelines to Support Emergency Management

Emergency Support Functions (ESFs)

Federal ESFs bring together the capabilities of federal departments and agencies and other national-level assets.

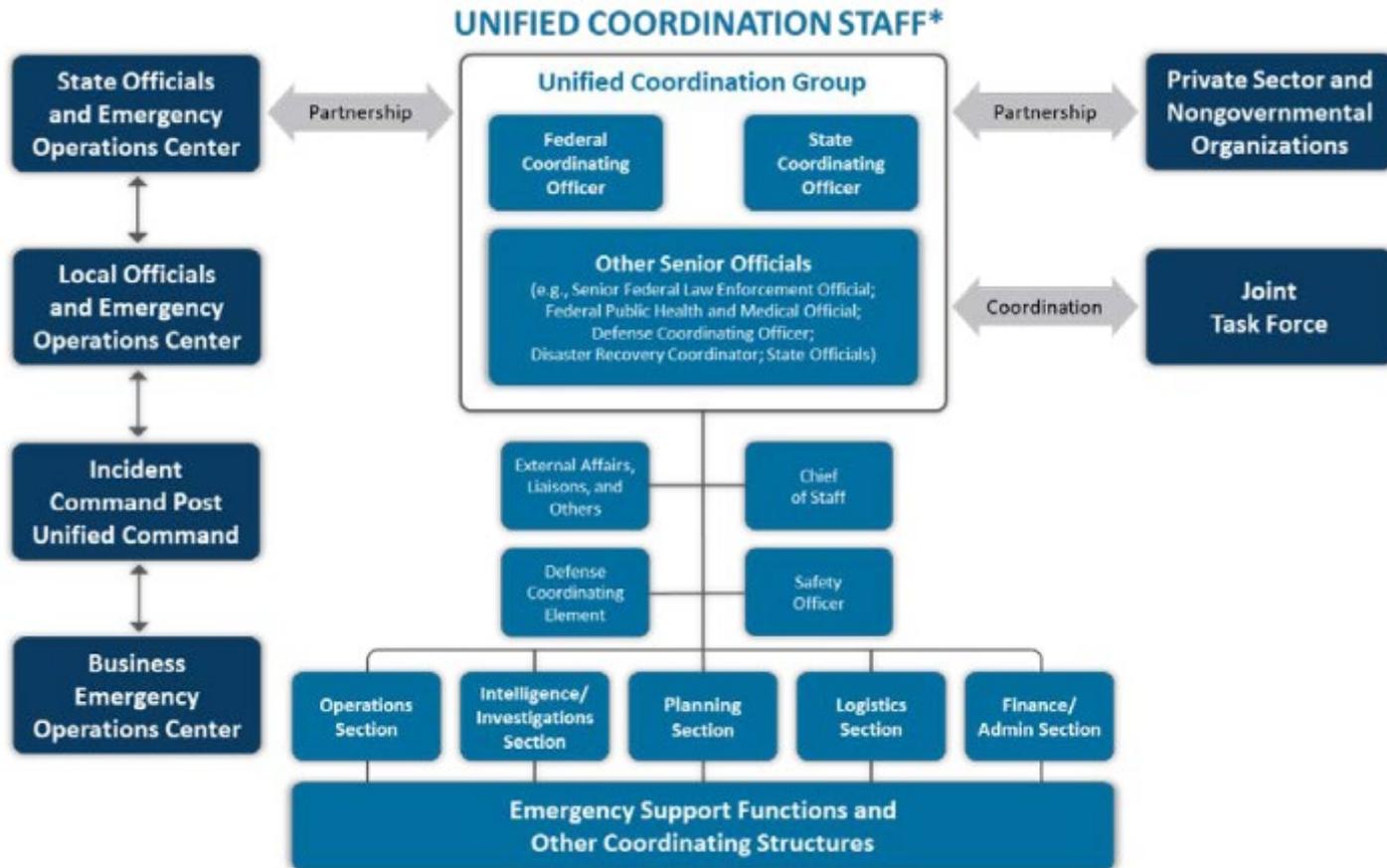
- Not solely attributed to only one agency, but groups of organizations that work together to deliver core capabilities to stabilize community lifelines in support of an effective response.
- NRF defines a primary or coordinating agency for each ESF.

ESF Primary agencies

- Orchestrates support and strategy development
- Coordinates support agencies
- Monitors progress
- Assists with incident planning, short-term recovery and transition to long-term recovery



Unified Coordination



*References to state also refer to tribal, territorial, and insular area governments.

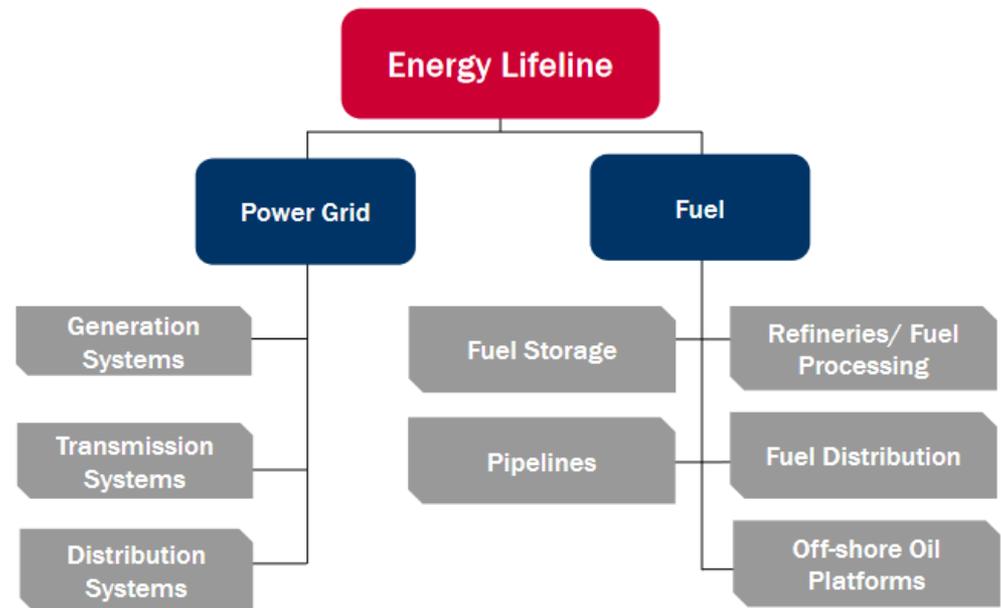
Community Lifeline - Energy



Services provided for electric power infrastructure, composed of generation, transmission and distribution systems, as well as gas and liquid fuel processing, transportation and delivery systems. Disruptions can have a limiting effect on the functionality or other community lifelines.

Focus on primary services but include in-depth consideration of critical infrastructure and interdependencies

- Energy impacts all lifelines



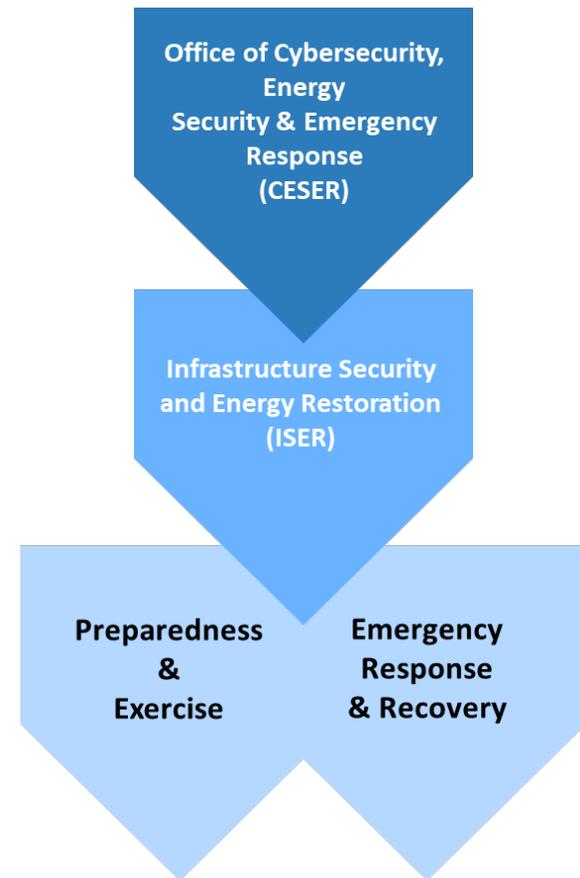
ESF #12 - Energy

The National Response Framework identifies the Department of Energy (DOE) as the federal coordinating agency for ESF #12.

Office of Cybersecurity, Energy Security, and Emergency Response (CESER)

- Supports preparedness and response efforts in the energy sector.
- During an incident requiring a coordinated federal response, CESER activates the Energy Response Organization (ERO) to manage ESF #12 and Sector Specific Agency (SSA) activities, including deployment of ESF #12 responders and sector engagement.

During steady-state and incident response, CESER coordinates with its industry, interagency, state, local, tribal, and territorial partners





Primary Functions of ESF #12

- Assess the impacts of a physical and cyber disaster on local and regional energy infrastructure
- Provide consistent and accurate situational awareness updates to Federal, state, and private sector partners
- Facilitate legal and regulatory waivers to accelerate restoration of damaged energy systems and components
- Provide technical expertise on energy damage assessment, restoration and logistical assistance as requested

Drivers and Authorities

The Department of Energy (DOE) is the coordinating agency for Emergency Support Function (ESF) #12, under the National Response Framework, and the Sector Specific Agency (SSA) for the energy sector, pursuant to Presidential Policy Directive (PPD) 21, PPD 41, Executive Order 13636, and the FAST Act.

Principle Authorities and Framework	Description
Presidential Policy Directive 8 (PPD-8), National Preparedness	Integrates efforts across the mission areas of Prevention, Protection, Mitigation, Response and Recovery
Presidential Policy Directive 21 (PPD-21), Critical Infrastructure Security and Resilience	Develop a situational awareness capability that addresses both physical and cyber aspects of critical infrastructure roles and responsibilities.
Homeland Security Presidential Directive 7 (HSPD-7)	Establishes a national policy for Federal departments and agencies to identify and prioritize critical infrastructure and to protect them from terrorist attacks.

Less commonly used authorities include:

- Defense Production Act of 1950
- Department of Energy Organization Act
- Energy Policy & Conservation Act
- Federal Energy Administration Act of 1974
- Federal Power Act
- Natural Gas Act, Natural Gas Policy Act
- Industrial Fuel Use Act of 1978
- FAST Act

Drivers and Authorities continued...

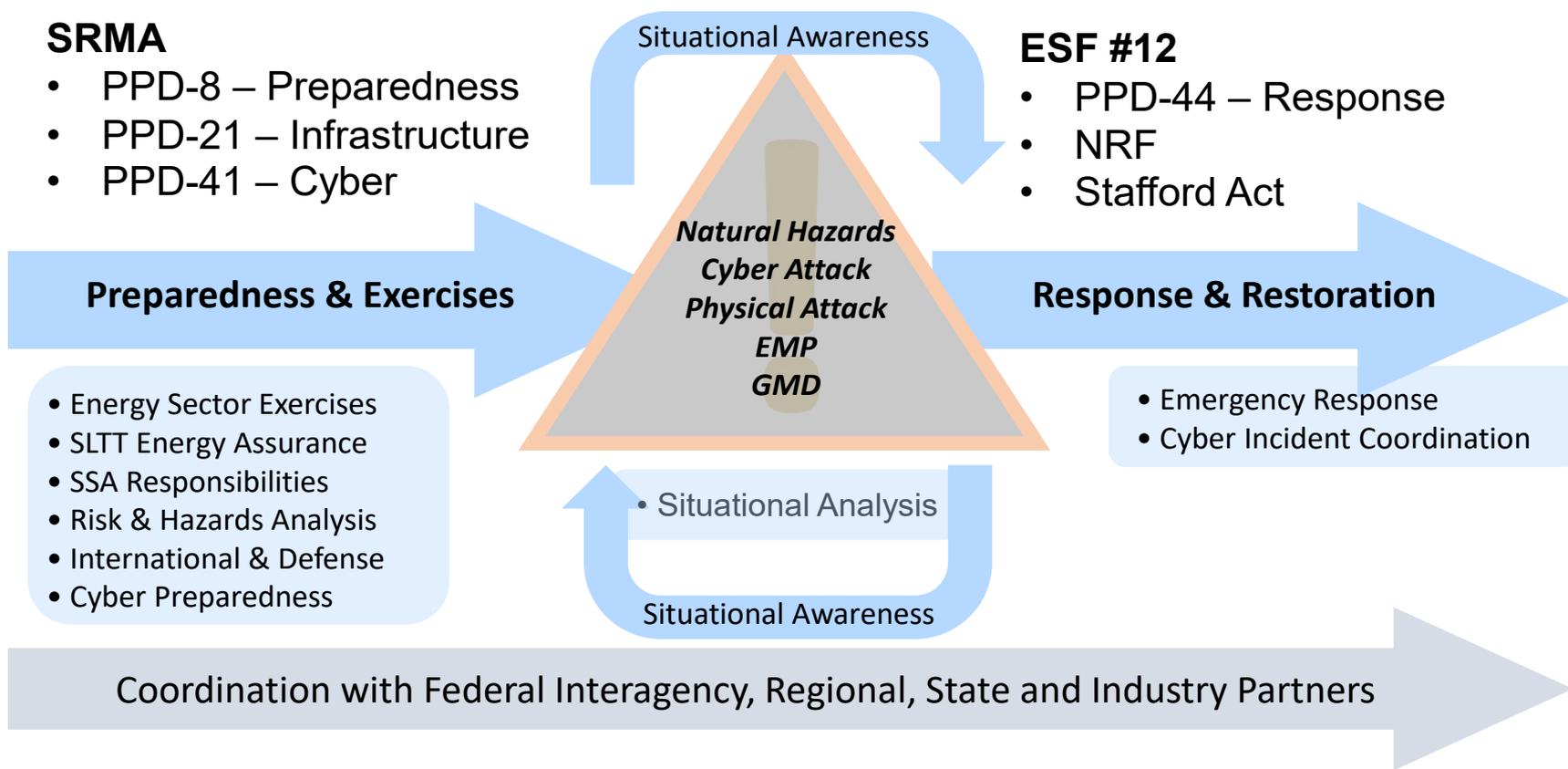
- PPD-21 identifies 16 critical infrastructure sectors (vital to US security, economic security and public health and safety). Each sector has a defined Sector Risk Management Agency (SRMA). DOE is the SRMA for the Energy Sector.

SRMA

- PPD-8 – Preparedness
- PPD-21 – Infrastructure
- PPD-41 – Cyber

ESF #12

- PPD-44 – Response
- NRF
- Stafford Act



All Hazard Response

FEMA/Stafford Act Events	Hurricanes Severe Weather Earthquakes Wildfires
Non-Stafford Act Events	Pipeline Disruptions
NSSE and SEAR Events	State of the Union Super Bowl
Physical Infrastructure	Enbridge Merrimac
Cyber Events	Cyber Incidents Ransomware



NSSE – National Special Security Event
SEAR – Special Event Assessment Rating

ESF #12 Functions

To fulfill DOE's responsibilities as the coordinating agency for ESF #12, CESER manages a cadre of volunteer ESF #12 responders, from across the Department. Upon activation of ESF #12 by FEMA or DHS, or a request for ESF #12 support from a State, DOE deploys responders to the:

- FEMA National Response Coordination Center
- FEMA Regional Response Coordination Centers
- FEMA Joint Field Offices
- State Emergency Operations Centers.

ESF #12 Community and Partners



DOE

- PMA's
- Fossil Energy
- EIA
- Congressional
- Public Affairs
- General Counsel
- NNSA
- National Labs

Support Agencies

- FEMA
- ESF#1: DOT
- ESF#2: DHS
- ESF#3: USACE
- ESF#8: HHS
- ESF#10: EPA
- ESF#11: DOA
- NRC

Industry Partners

- ESCC
- APPA
- EEI
- NRECA
- ONG SCC
- ISACs
- Affected Entities

State Partners

- State ESF#12
- State Energy Office
- Energy Assurance Plans

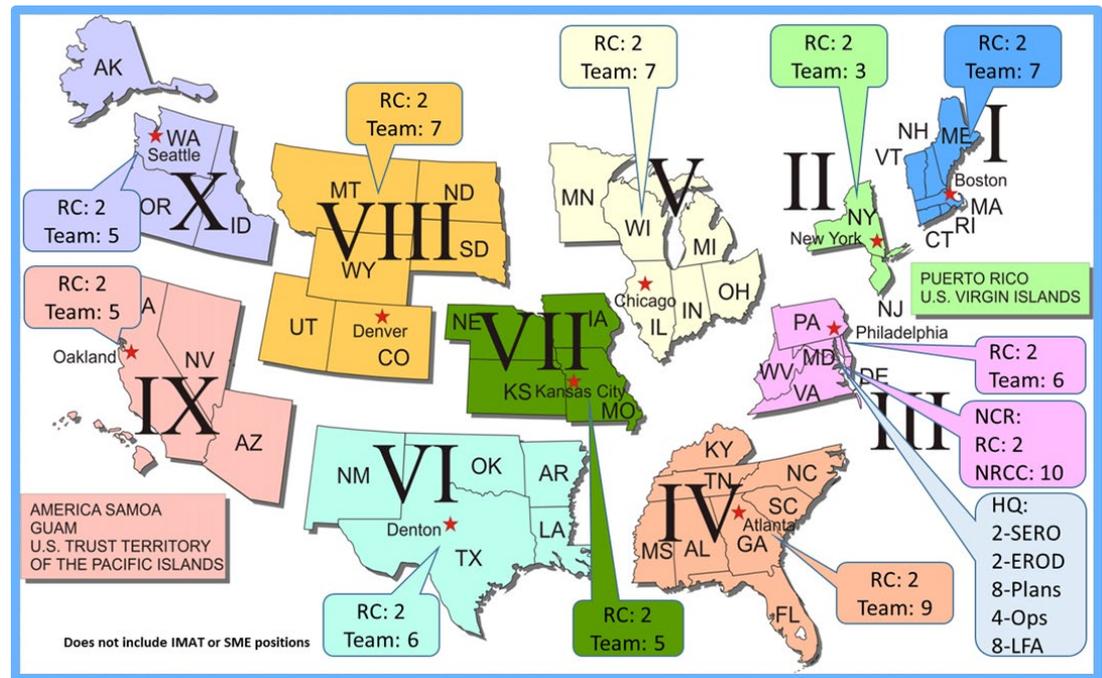
ESF#12 Targeted Regional Positions

Each FEMA Region has an assigned DOE ESF #12 Regional Coordinator, whom maintains regular contact and supports planning efforts with regional and state counterparts. Additionally, a subset of ESF #12 responders are part of the ESF #12 Catastrophic Incident Response Team (CIRT) to respond to catastrophic incidents.

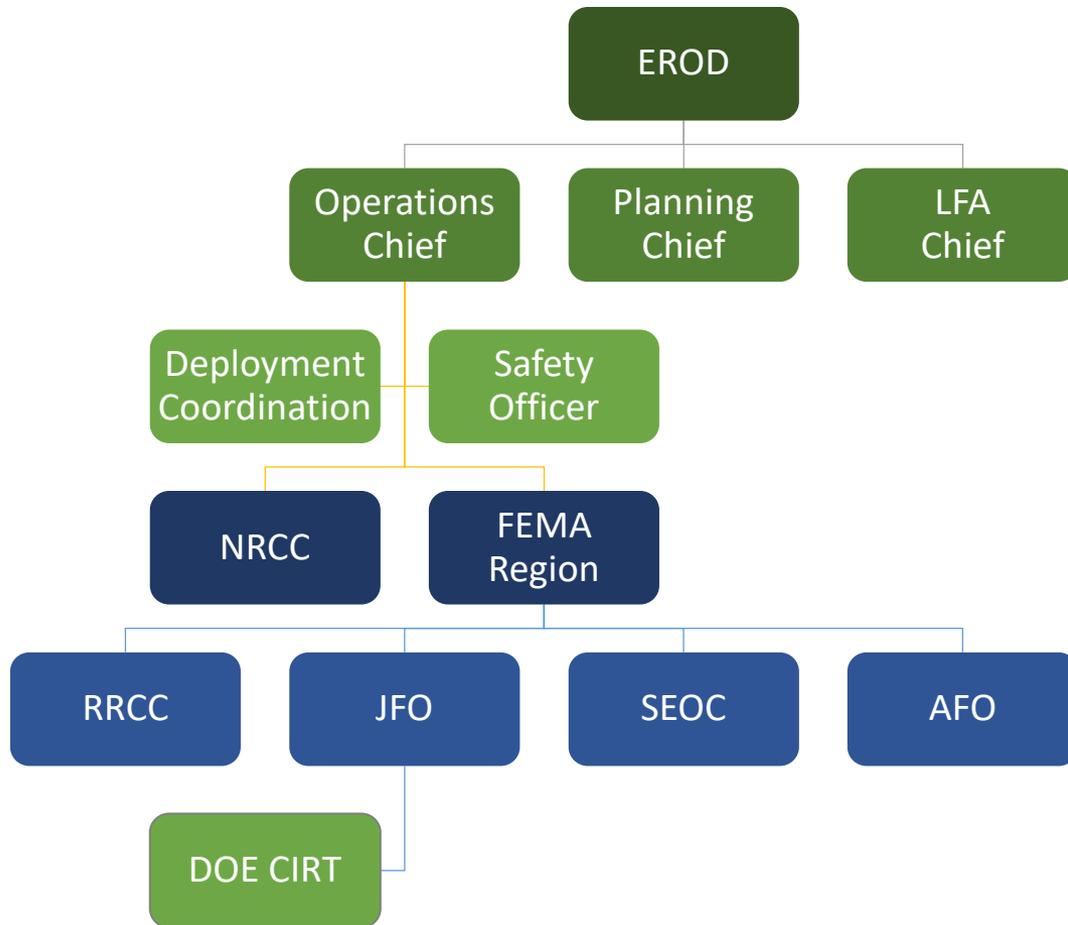
- 130 active volunteers from across DOE complex

Regionalization Goals:

- Ability to respond to multiple, simultaneous, or back-to-back events
- Value added products, tools and technical expertise at the regional and State levels
- Stronger interagency ties at the regional and State levels
- Enhanced response capabilities:
 - Steady state relationship building
 - Regionally based team training
 - Increased responder familiarity with regional and State energy infrastructure; products and tools to support



ESF #12 Catastrophic Incident Response Team (CIRT)



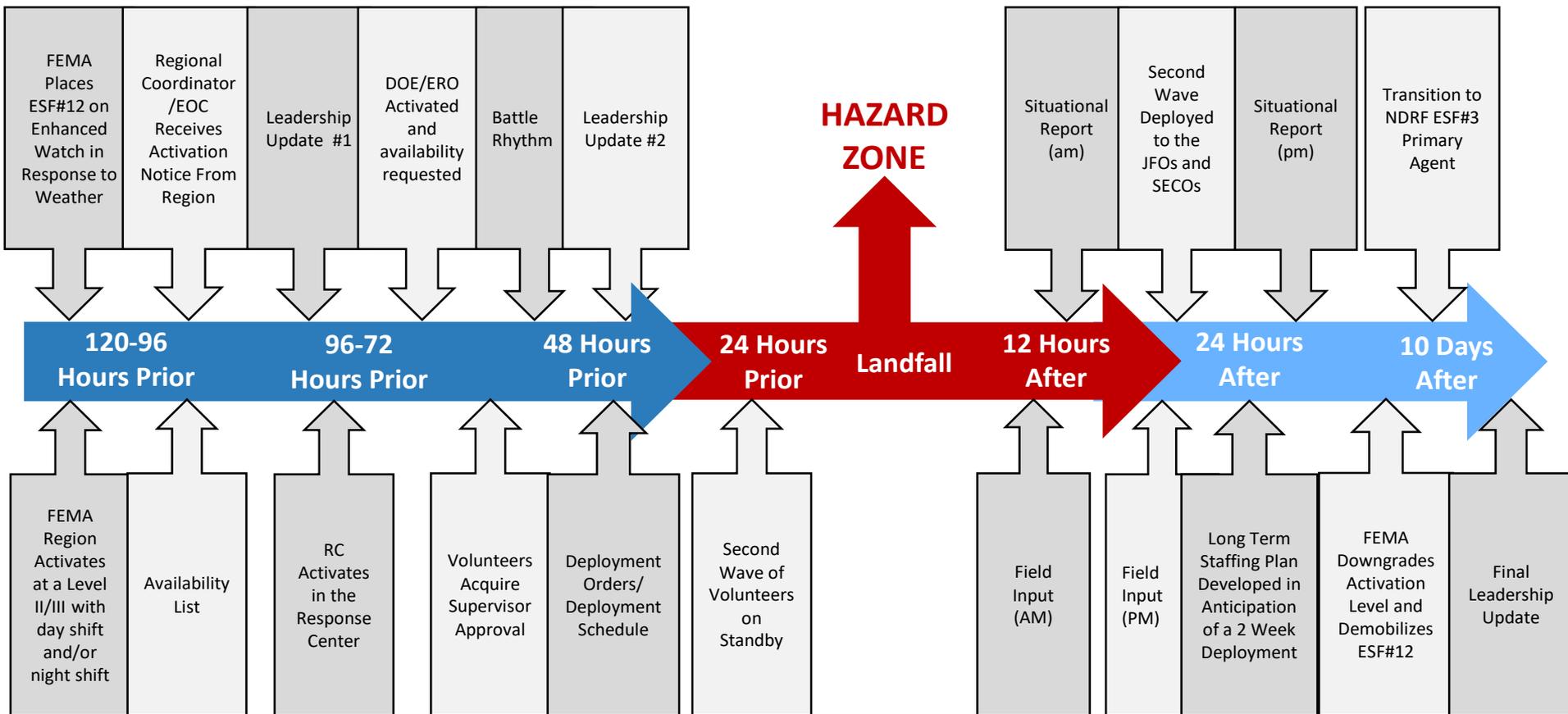
ESF #12 responders that have specialized training and skillsets.

Forward deploy for notice events.

The response team consists of two SMEs and a Communicator/LNO responder.

Activations: Timeline

Stafford/ESF#12 Notice Event Timeline



Activations: Levels

DOE/ERO Activation Level	Criteria	Staffing	Products
I (Major Event)	<ul style="list-style-type: none"> FEMA Level I Activation Major Disruption to Energy Systems Electrical Outages outage total >1,000,000 customers without power Outages > 25% of a state OR Unique Circumstances 	<u>DOE</u> Partial to full staff at HQ and field <u>FEMA</u> Partial to full ESF #12 staffing (with 24/7 Coverage)	Situation Report
II (Significant Event)	<ul style="list-style-type: none"> FEMA Level II Activation Significant Disruption to Energy Systems Spot outage total >500,000 customers without power OR Outages > 20% of a state OR Unique Circumstances 	<u>DOE</u> Partial staff at HQ May deploy to the field <u>FEMA</u> Moderate ESF #12 staffing (day-shift only)	Spot Report
III (Enhanced Watch)	<ul style="list-style-type: none"> FEMA Level III Activation Requirement for Enhanced Watched Activity Spot outage total >250,000 customers without power OR Outage > 15% of a state OR Unique Circumstances 	<u>DOE</u> Minimal staff at HQ <u>FEMA</u> Minimal or virtual ESF #12 staffing	DOE Leadership Awareness Alert
IV (Steady State)	<ul style="list-style-type: none"> Steady State Monitoring 	<u>DOE</u> Routine monitoring and situational awareness <u>FEMA</u> No requests	CESER Daily Monitoring

Products and Tools

EAGLE-I

Provides near-real time power outage information and platform for DOE's situational awareness products

Pre-Storm Regional Overview

Primer to provide an overview of energy sector in a potentially impacted region

Situations Reports

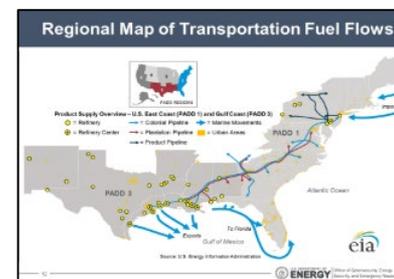
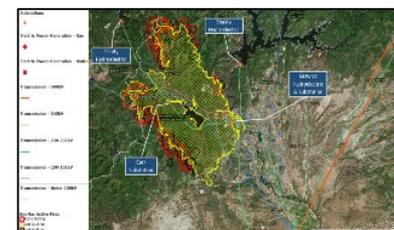
Comprehensive overview on the status of the energy sector during an incident DOE produces both an Official Use Only and public version

Predictive Power Outage Estimates

Provides estimate of peak customer outages within the 72-hour forecast using the Argonne National Lab HEADOUT model

Imagery, Flood Detection, & Damage Assessments

Provide post-incident imagery and flood detection around key energy assets and working towards automated damage detection

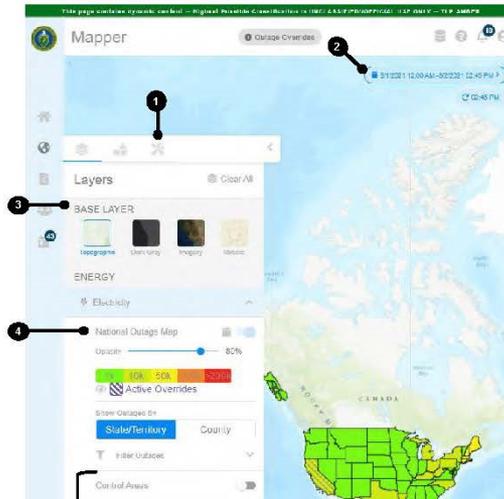


EAGLE-I™

Mapper



- Tools – Search, Import Layer**
Search in a user-drawn polygon/circle or defined latitude/longitude coordinate radius. Import unrestricted, publicly available WMS and ArcGIS REST Image service layers for a single use session.
- Date Range**
Filter certain layers (e.g., NOM, Gas Prices, Gas Buddy Stations, Earthquakes, DHS NOC Media, and Social Media) by a date range.
- Base Layer**
Change the base layer for the map (e.g., Dark Gray, Imagery, Streets).
- National Outage Map**
Display total affected customers or percentage of customers with outages by State/Territory or County for specified FEMA regions/States for specific time periods. Trained users can override collected data with known data, indicated on the map by purple diagonal lines.
- Other Electricity Layers**
Display Control Areas, ISO Regions, Transmission Lines, Power Plants, Electric Service Regions, and Substations.

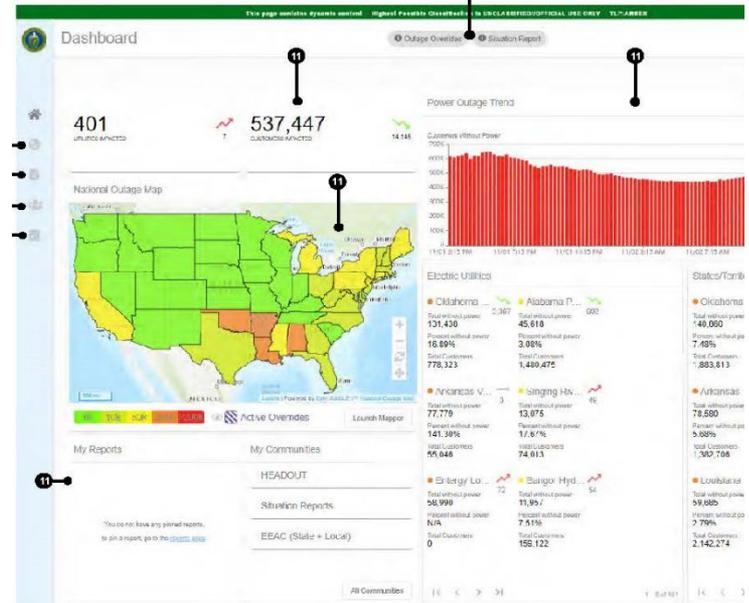


EAGLE-I™

Dashboard



- Mapper**
Combines **Infrastructure Mapping** and **Real-Time Energy Monitoring** to display the nation's energy infrastructure and current weather hazards as well as electrical outages or other energy events in near real-time.
- Reports**
Prepares automated reports, such as customer outages by region or by utilities, OE-417 electric emergency events, and operational status of utilities.
- Communities**
Assists with communication between community stakeholders through shared documents. Community managers can add members and upload documents.
- Events**
Highlights current trending events in social media that may impact the nation's energy grid as well as OE-417, ISO Notices, Natural Gas Notices, and EAGLE-I alerts.
- Notification Banner**
Alerts to outage override data superseding collected EAGLE-I data for a specific county(s) or new reports.
- Data**
Download CSV file of outage data. Trains outage events, outage override information, Infrastructure Library (EIL) datapoints, or Coordination Center (RRCC) Deployment.
- Help**
Provides EAGLE-I documentation, FAQ, or system information.
- System Notification**
Alerts the user to system news, community password resets.
- User Menu**
Change password and legend, define preferences, subscribe to alerts, and request.
- Customize Dashboard**
Create multiple customized Dashboards.
- Dashboard Widgets**
High level data of impacted customers, utilities, power outage trend chart; Nation summary data; user-specific community.



March 10, 2021

EAGLE-I

Real-Time Energy Monitoring Dashboard

<https://eagle-i.doe.gov/login/account-request>

Situation / Spot Reports

- Event Summary
- DOE Actions
- Electricity Sector Info
- ONG Sector Info
- Declarations and Waivers
- Distribution lists:
 - Limited TLP Protocol - Amber (OUO)
 - Public version



Typhoon Yutu | Situation Report #15

REPORT TIME & DATE: 10:30 AM EST | Friday, November 16, 2018
INCIDENT START DATE: Wednesday, October 24, 2018
PRIMARY LOCATION(S): Commonwealth of the Northern Mariana Islands
REPORT DISTRIBUTION: DOE & Federal Agencies
REPORT POC: Matthew Tarduogno (202-586-2892// matthew.tarduogno@hq.doe)

following report may contain OFFICIAL USE ONLY information and is for internal U.S. Government use only. This report is not intended for public disclosure or dissemination unless otherwise noted or approved by the U.S. Department of Energy.

Following today's report, the U.S. Department of Energy will transition to issuing a weekly situation reports about the energy sector from Typhoon Yutu on Tuesdays. The next report will be issued on November 20, 2018.

EXECUTIVE SUMMARY

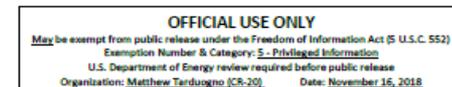
Typhoon Yutu passed directly over Tinian in the Commonwealth of the Northern Mariana Islands (CNMI) on October 24 (Eastern Time) // October 25 (local time) as a category 5 typhoon, with maximum sustained winds of 180 MPH, impacting Tinian, Saipan, and Rota in the CNMI, as well as Guam.

Electricity Sector Summary

- **Saipan, CNMI:** DOE estimates 75 – 85 percent of customers remain without grid power. As of November 12, Power Plant 1 has approximately 41 MW of generating capacity and was carrying 10 – 16 MW of load. Power has been restored to the Hospital, Office of the Governor, FEM Field Office, 78 of 131 water wells, as well as a waste water plant, and repaired areas along Feeder 1, 2, 3, 4, and 7. The Kiya substation has been energized and Feeder Kiya 2 primary energized to the entrance of the airport.
- **Tinian, CNMI:** All customers remain without grid power. Plan for equipment, material, and resources to start the rebuild of Tinian have been mobilized. Power Plant engine #2 was re-energized to provide station service and a precursor to restoring load. All water service has been restored. As of November 15, a staging area is set for the arrival of 200 poles and heavy equipment.
- **Rota, CNMI:** All customers have been restored.
- The Commonwealth Utility Corporation (CUC), in coordination with FEMA, has contracted a company from Colorado to be the primary contractor supporting CUC with restoration efforts.
- The Guam Power Authority has provided personnel and equipment to CUC to support the restoration efforts. Other members of the Pacific Power Association are also providing per-

Natural Gas Sector Summary

- All ports have reopened.
- CNMI reports that fuel supply on Saipan is adequate and that normal resupply to Rota and Tinian have been reestablished. Saipan is receiving regular fuel shipments from Guam.
- Eleven retail service stations are open on Saipan, mainly running on generator power. Several stations remain closed due to damage from Typhoon Yutu.
- One retail service station on Tinian is open, operating on generator power.



PAGE

Energy Sector Risk Profiles

FEMA Region 7 ENERGY SECTOR RISK PROFILE



This Energy Risk Profile examines the relative magnitude of the risks that Federal Emergency Management Agency (FEMA) Region 7's energy infrastructure routinely encounters in comparison with the probable impacts. FEMA Region 7 includes Iowa, Kansas, Missouri, and Nebraska.

Natural and man-made hazards with disruption of the energy infrastructure and adversarial threats, such as cyber pulse, geomagnetic disturbance, par by infrastructure interdependencies, based probabilistic risk assessment a geographic boundaries, have limited historic data. Cybersecurity and other profiles are ever present and should security planning. A complete list of comparisons can be found in the Dat

Region 7 Facts

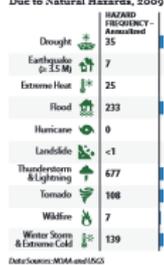
- POPULATION: 14.12 M
- HOUSING UNITS: 6.34 M
- BUSINESS ESTABLISHMENTS: 0.37 M
- ENERGY EMPLOYMENT: 154,806 jobs
- POPULATION-WEIGHTED AVERAGE ELECTRICITY TARIFF: 9.74 cents/kWh
- POPULATION-WEIGHTED ENERGY EXPENDITURES: \$3.89/capita
- POPULATION-WEIGHTED ENERGY CONSUMPTION PER CAPITA: 372 MMBtu
- GDP: \$400.0 billion

Data from 2019 or most recent year available. For more information, see the Data Sources document.

Region 7 Risks and Haz:

- The natural hazard that caused th between 2009 and 2019 was Tere year (4th leading cause national)
- Region 7 had 4,467 Major Disaster Declarations, and 14 Fire Manag for 55 events between 2013 and 2
- The FEMA Region 7 office is loca and Nebraska.

Annualized Frequency of and Due to Natural Hazards, 2009-2019



ANNUAL ENERGY CONSUMPTION
 ELECTRIC POWER: 206,260 GWh
 COAL: 85,500 MStN
 NATURAL GAS: 1,189 Bcf
 MOTOR GASOLINE: 155,000 Mbbbl
 DISTILLATE FUEL: 105,400 Mbbbl

ANNUAL ENERGY PRODUCTION
 ELECTRIC POWER GENERATION: 277 plants, 228.1 TWh, 61.3 GW total capacity
 Coal: 39 plants, 115.5 TWh, 25.8 GW total capacity
 Hydro: 20 plants, 4.4 TWh, 1.0 GW total capacity
 Natural Gas: 178 plants, 19.7 TWh, 18.0 GW total capacity
 Nuclear: 4 plants, 30.6 TWh, 4.0 GW total capacity
 Petroleum: 239 plants, 0.4 TWh, 3.2 GW total capacity
 Wind & Solar: 214 plants, 56.7 TWh, 19.1 GW total capacity
 Other sources: 23 plants, 0.8 TWh, 0.7 GW total capacity

COAL: 200 MStN
 NATURAL GAS: 180 Bcf
 CRUDE OIL: 35,000 Mbbbl
 ETHANOL: 168,400 Mbbbl

Data from IFA 0708-2018

Produced by Department of Energy (DOE), Office of Cybersecurity, Energy Security, and Emergency Response (CESER)

State of Iowa ENERGY SECTOR RISK PROFILE



This State Energy Risk Profile examines the relative magnitude of the risks that the state of Iowa's energy infrastructure routinely encounters in comparison with the probable impacts. Natural and man-made hazards with the potential to cause disruption of the energy infrastructure are identified. Certain natural and adversarial threats, such as cybersecurity, electromagnetic pulse, geomagnetic disturbance, pandemics, or impacts caused by infrastructure interdependencies, are ill-suited to location-based probabilistic risk assessment as they may not adhere to geographic boundaries, have limited occurrence, or have limited historic data. Cybersecurity and other threats not included in these profiles are ever present and should be included in state energy security planning. A complete list of data sources and national level comparisons can be found in the Data Sources document.

Iowa State Facts

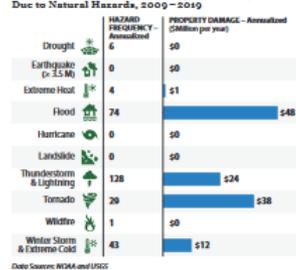
- POPULATION: 3.16 M
- HOUSING UNITS: 1.41 M
- BUSINESS ESTABLISHMENTS: 0.08 M
- ENERGY EMPLOYMENT: 33,979 jobs
- PUBLIC UTILITY COMMISSION: Iowa Utilities Board
- STATE ENERGY OFFICE: Iowa Energy Office
- EMERGENCY MANAGEMENT AGENCY: Iowa Department of Homeland Security and Emergency Management
- AVERAGE ELECTRICITY TARIFF: 8.50 cents/kWh
- ENERGY EXPENDITURES: \$4.81/capita
- ENERGY CONSUMPTION PER CAPITA: 496 MMBtu
- 5th highest out of 50 states and Washington, D.C.
- GDP: \$180.7 billion

Data from 2019 or most recent year available. For more information, see the Data Sources document.

Iowa Risks and Hazards Overview

- The natural hazard that caused the greatest overall property loss between 2009 and 2019 was Flooding at \$4.0 billion per year (leading cause nationwide at \$4.8 billion per year).
- Iowa had 347 Major Disaster Declarations, 0 Emergency Declarations, and 0 Fire Management Assistance Declarations for 15 events between 2013 and 2019.
- Iowa registered 1% greater Heating Degree Days and 5% greater Cooling Degree Days than average in 2019.
- There is 1 Fusion Center located in Des Moines.

Annualized Frequency of and Property Damage Due to Natural Hazards, 2009-2019



ANNUAL ENERGY CONSUMPTION
 ELECTRIC POWER: 51,210 GWh
 COAL: 18,700 MStN
 NATURAL GAS: 431 Bcf
 MOTOR GASOLINE: 29,100 Mbbbl
 DISTILLATE FUEL: 25,000 Mbbbl

ANNUAL ENERGY PRODUCTION
 ELECTRIC POWER GENERATION: 274 plants, 61.7 TWh, 15.9 GW total capacity
 Coal: 13 plants, 22.2 TWh, 5.8 GW total capacity
 Hydro: 3 plants, 0.8 TWh, 0.1 GW total capacity
 Natural Gas: 43 plants, 7.7 TWh, 4.2 GW total capacity
 Nuclear: 1 plant, 5.2 TWh, 0.7 GW total capacity
 Petroleum: 90 plants, 0.2 TWh, 0.9 GW total capacity
 Wind & Solar: 110 plants, 25.3 TWh, 9.9 GW total capacity
 Other sources: 6 plants, 0.2 TWh, 0.0 GW total capacity

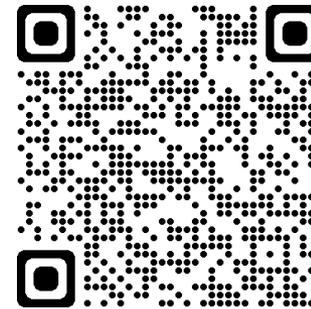
COAL: 0 MStN
 NATURAL GAS: 0 Bcf
 CRUDE OIL: 0 Mbbbl
 ETHANOL: 98,000 Mbbbl

Data from IFA 0708-2018

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Overview of Regional and State Risks and Hazards

- Electricity
- Natural Gas
- Petroleum



State and Regional Energy Risk Profile Link

<https://www.energy.gov/ceser/state-and-regional-energy-risk-profiles>



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 Cybersecurity, Energy Security,
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SLTT Program Resource Library

RESOURCE ▲	PROJECT PARTNER ▼	TOPIC AREA ▼	TYPE ▼
<p>Public Utility Commission Participation in GridEx V: A Case Study This case study examines the experiences of six public utility commissions who participated in GridEx V. It highlights the benefits they perceived as well as the challenges they encountered. Through GridEx, PUCs have the opportunity to build relationships, clarify roles, and strengthen their response capabilities in coordination with key partners.</p>	NARUC	Exercises; Emergency Response; Preparedness; Cybersecurity; Energy Security	Case Study
<p>Guiding Principles for Emergency Management on Cybersecurity This Guide details the leadership, culture, and strategy that state emergency management agencies should adopt to protect their organizations from growing cybersecurity threats.</p>	NEMA	Cybersecurity; Emergency Response	Guide
<p>Southeast Petroleum Shortage Response Planning Workshop A summary and presentations from a petroleum shortage response planning workshop in which 12 states, federal and industry partners participated.</p>	NEMA; NASEO	Emergency Response; Preparedness	Report; Presentation
<p>Public Power Emergency Preparedness Tabletop Exercise in a Box This TTX-in-a-Box has everything you need to conduct a tabletop exercise, facilitating the exercise, and conducting a post-exercise debrief.</p>	APPA	Exercises; Emergency Response; Preparedness	Webinar/Training
<p>Energy Infrastructure Resilience and Mitigation CESER, OE and the Kentucky Office of Energy Policy presentation for CDBG-MIT grantees interested in mitigating risks to the energy community lifeline with an emphasis on electric infrastructure. Highlights how CDBG-MIT funds can take an "all hazards" approach to improving the resilience and reliability of the energy sector.</p>	DOE	Risks and Hazards; Energy Security	Presentation

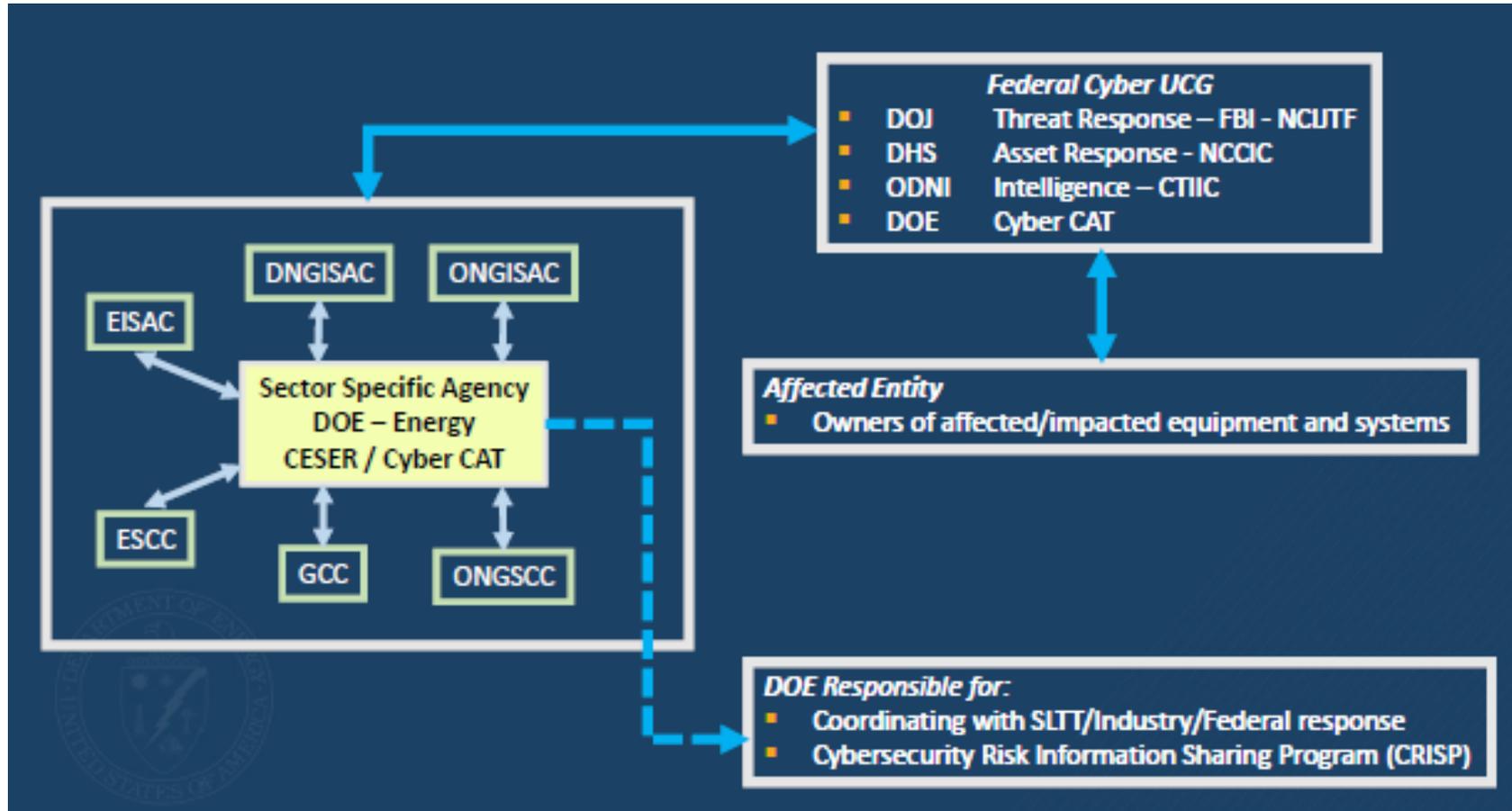
- Tools
- Case studies
- Guides
- Reports
- Presentations
- Webinars/training



Link to SLTT Resource Library

<https://www.energy.gov/ceser/sltt-program-resource-library>

DOE Cyber Response Overview



Questions??

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