MGA
America's Smartland
Midwestern Governors Association

CONVERGE STRATEGIES

Advisory Group Meeting

Framework Development Update
Energy Risk + Criticality and Restoration Priorities

08 August 2024

Agenda

CONVERGE STRATEGIES

01	Framework Overview
02	Energy Risk + Criticality
03	Restoration Priorities
04	Next Steps + Action Items

Framework Overview

Framework Development Plan

Restoration Priorities

Summer 2024

Energy Risk and Criticality

Summer 2024

Interdependency Planning

Fall 2024

Resource Adequacy

Winter 2025

Design & Integration

Winter 2025

*Note: The MGA project will include frameworks for all five topics. At the workshop, participants voted to build out the frameworks for three blue topics first. Full definitions for all five framework concept can be found in **Appendix A.** Summaries from the workshop can be found in Appendix B.*

Framework Outline

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Introduction Section – What is this Material and Why was it Created?

Admin Section. This will include information about the effort and MGA. It will also include sections for acknowledgement, table of contents, and acronyms. Any DOE required language will be included in here, as well.

Purpose. Reliability issues, changing weather conditions, and increasing demand challenge states across the Midwest. This material can help states map out their energy strategy priorities.

Framework Section Overview. Summarizes the five topics and what to expect from this document.

User Guide – How To Use This Material

Who can use it and when they can use it. This section will identify different organizations who can engage with the document. It will also share relevant plans, policies, and guidance that authorizes people to do this type of work.

Framework Format and Contents . Each section will be structured similarly and will include information about a) resources and stakeholders b) whether centered around the economy, state resilience, or energy diversification.

Energy Risk + Criticality

Energy Risk & Criticality | Review

Summary

Energy risk is the potential for energy infrastructure to be impacted by natural and man-made hazards. Its criticality is determined by its susceptibility to hazards, impacts of its disruption on connected systems, presence or lack of redundancy, and the asset's historical performance. The framework will suggest how organizations can develop a shared, standardized risk assessment methods to address system-level risk.

Gap 1

No Single Method for Assessing Risk

Different organizations calculate risk differently. The framework will:

1. Recommend ways organizations can work together to create a standardized risk assessment process.
2. Explain how organizations can define risk for their own critical infrastructure.
3. Share ideas on what organizations can do after assessing critical infrastructure risk.

Gap 2

Uncertainty of Service for Critical Functions

This gap leaves many questions to be answered. The framework will share steps for how organizations can:

1. Understand the differences between system-level vs individual risks.
2. Navigate various risk tolerances across multiple entities & assets.
3. Improve outdated methods of identifying and mitigating risk, esp. regarding interregional connections.

Best Practices/ Resources

1. National Institute of Standards and Technology (NIST) Cybersecurity Framework
2. Organizational frameworks: NERC CIP, FEMA THIRA

Path Forward

1. Review existing risk resources such as VRAs, THIRAs, and utility processes to create a consolidated risk "spectrum" that captures ranges of risk based on asset types and critical functions.
2. Develop impact "tiers" to better quantify and understand the impacts of events relative to the number of critical assets impacted.

Energy Risk & Criticality Outline

1. Problem Statement
   a. There is no uniform method for determining risk and service criticality levels

2. Resources & Stakeholders
   a. Features examples of existing risk assessments that can inform new processes

3. Flowchart: Consolidated Risk Spectrum
   a. Energy Strategy Crosswalk
   b. Risk Assessment
   c. Dimensions of Energy Risk
   d. Criticality Matrix

Resources and Stakeholders | Energy Risk & Criticality

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Energy Risk & Criticality

1	**Federal Frameworks**	**Threat and Hazard Identification and Risk Assessment (THIRA)** to understand what the state has defined as hazards
2	**State Plans**	**State Energy Security Plans (SESPs)** to understand energy resilience strategy
3	**Risk Assessments**	**Vulnerability and Risk Assessments (VRA)** informed by THIRA to understand asset susceptibility to risks

Flowchart | Consolidated Risk Spectrum

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Step 1
Energy Strategy Crosswalk

Step 2
Risk Assessment

Step 3
Dimensions of Energy Risk

Step 4
Criticality Matrix

The chosen driver of your Energy Strategy Crosswalk can either guide your decision-making throughout the Consolidated Risk Spectrum or be understood as an outcome of Steps 2-4

Consolidated Risk Spectrum | Step 1 And 2

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Step 1

Energy Strategy Crosswalk

Determine primary driver of your energy security strategy to guide risk assessment perspective

Diversification: The availability or use of multiple energy source types

Economic: Using energy to drive economic growth or stability (i.e. providing funding for solar PV programs with goal of providing jobs like electricians, construction, etc.)

Resilience: The desire for the grid to withstand and recover from outages and disruptions

Step 2

Risk Assessment

Consider multiple aspects of risk

Probability vs Impact Matrix: Consider the probability of a risk occurring against its perceived level of impact

Risk Tolerance Level: Determine the level of risk you can and will accept

VRA Outputs: Understand how susceptible your asset is to predefined risks

Consolidated Risk Spectrum | Step 3 And 4

Step 3

Dimensions of Energy Risk

Analyze the effects this risk will have on the system

Geographic Scale: Is the distribution, transmission, or interregional system affected?

Duration: How long will the impact last: 6-8 hours, multi-day, or multi-week?

Affected Populations: What group is affected: vulnerable people, public health, or mass migration?

Cross Sector Impact: How have other sectors been affected: degraded, disrupted, or destroyed?

Step 4

Criticality Matrix

Determine how critical an asset is

Redundancy: Are there multiples of this asset or backups available?

Risk Assessment Output: What was the outcome of your risk assessment?

Dimension of Energy Risk: What is this asset affecting?

Rate of Failure: What is this asset's historical performance? What stage of lifecycle is this asset in?

Restoration Priorities

Restoration Priorities | Review

Summary

Restoration priorities determine how, when, and to whom energy will be restored, considering available emergency response resources and risk analysis tools. States, RTOs, and utilities have different prioritization and response plans, some of which are dependent on one another. This framework will share insights for building a common prioritization method, incorporating both successful resource planning and emergency response.

Gap 1

Unknown Unknowns

Organizations may not be aware of how other restoration priorities and plans affect them. The framework will:

1. Recommend what to incorporate into asset/load criticality categories (e.g., public safety, medical)
2. Discuss how criticality affects load shedding and restoration.
3. Give considerations on what impact types (economic, human, etc.) may affect load prioritization category.

Gap 2

No Standard for Determining Restoration Priorities

Even within the same organization, priority levels change depending on circumstances. The framework will:

1. Suggest processes for identifying available options, equipment, and gaps.
2. Map out steps for responding to different types of outages (e.g., range of severity and causes).

Best Practices/ Resources

1. Utility and ISO/RTO processes for forced load shedding and identification of critical distribution feeders and transmission corridors.
2. Emergency Operations Plans and FEMA Community Lifeline models for identifying critical infrastructure and assets.
3. State Energy Security Plans that identify priority loads and assets.

Path Forward

1. Analyze existing methods to identify/develop a common set of variables. This analysis will help users determine priorities prior before an event takes place.
2. Leverage industry and government processes and establish energy emergency "phases" or "THREATCON" levels. These may aid in rapid decision-making around prioritization.

Restoration Priorities | Outline

1. Problem Statement
   a. Lacking aligned processes: if aligned ahead of time, users can be more clear-headed, prepared, effective, and efficient during disaster events.

2. Resources and Stakeholders

3. “Choose Your Own Adventure” Section

Resources and Stakeholders | Restoration Priorities

Restoration Priorities

1 State Plans

- **Emergency Operations Plans:** Language about how the state executes consequence management
- **POIA:** Not every state has one. This articulates how the state priorities their assets
- **State Energy Security Plan:** The material will explain what to look for in this plan.

2 Utility Data

- Very functional information about how many customers are served and where the feeders are
- **Challenge:** with so much data, it could be hard to know what to ask for. This section will provide pointers for how to phrase questions to utilities and grid operators.

3 Standardized Language

- FEMA Critical Lifelines
- Overview of other THREATCON language to provide examples for how states can create their own standardized language.

Choose Your Own Adventure Flowchart | Stage 1

Standardized Language

Purpose

This Section will provide pointers on how classify an impact using standardized language.

1. It will reference best practices from already-existing standards (e.g., utility/ grid operator/ state threat levels)
2. Using those best practices, it will provide recommendations for how states can convene stakeholders and co-create a standardized language.

Caveats that will be considered in these recommendations

- Real-time priorities should be driven by the types of event occurring.
- Goal is to help the state to understand the utility model

Choose Your Own Adventure Flowchart | Stage 2

Standardized Language

Risk-Informed Priorities

States and other orgs have existing processes for dealing with real time priorities. This section will:

- Summarize some of these existing processes
- Suggest how states can integrate stakeholders into their processes
- Add key questions that can be used for talking with utilities, grid operators, etc.

Dimensions of Risk

States can't solve everything at one time. The goal is to understand - what disruption are you trying to mitigate it first. States can use a combination of these risks below to inform their priorities.

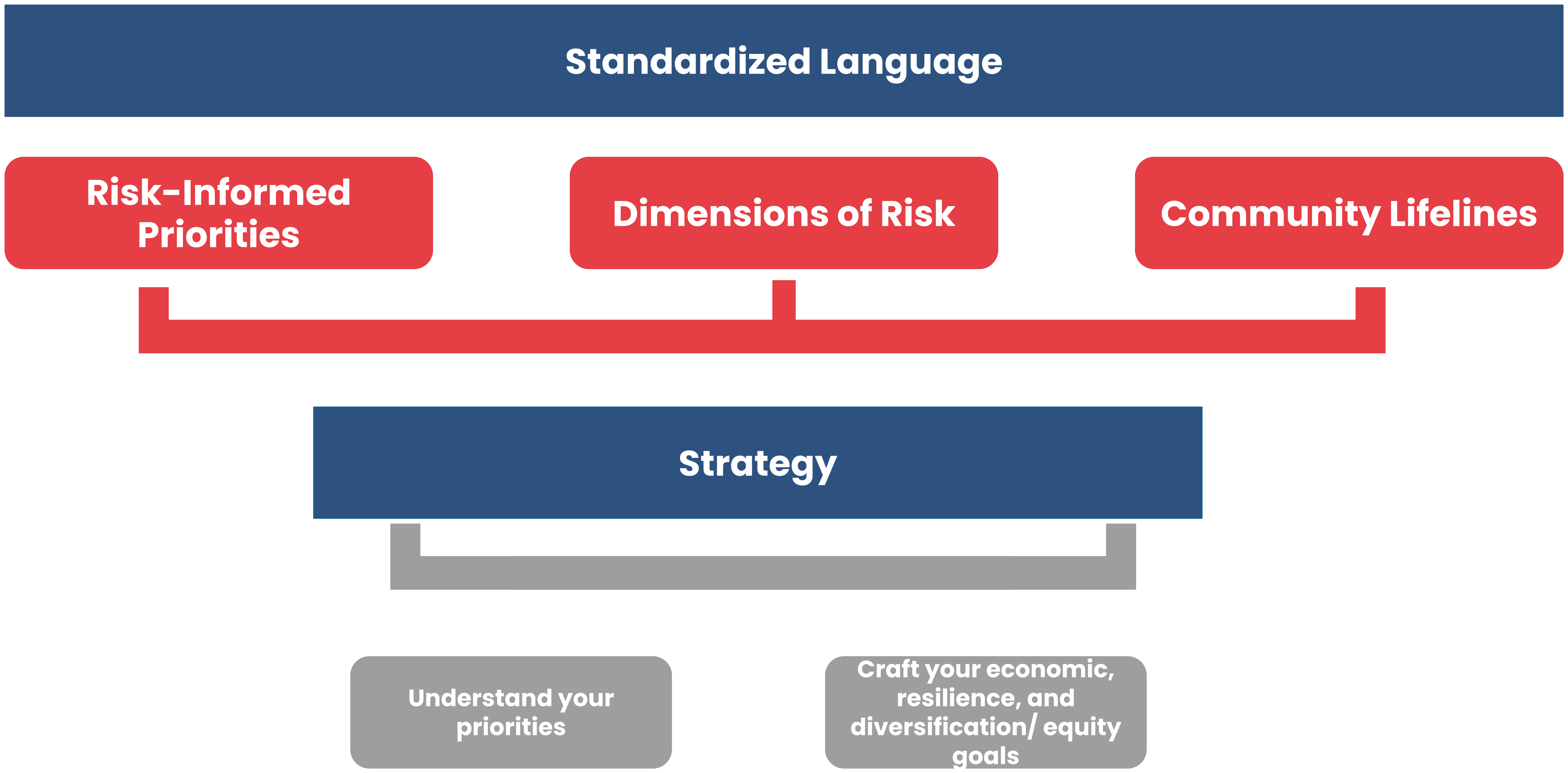
- Scale: local feeders
- Affected population: Who is affected and how many? E.g., healthcare and public safety?
- Duration: BES Assets
- Cross sector: Will the electric disruption cause communications or water disruptions?

Community Lifelines

What lifelines are affected?

Event-driven

Choose Your Own Adventure Flowchart | Stage 3



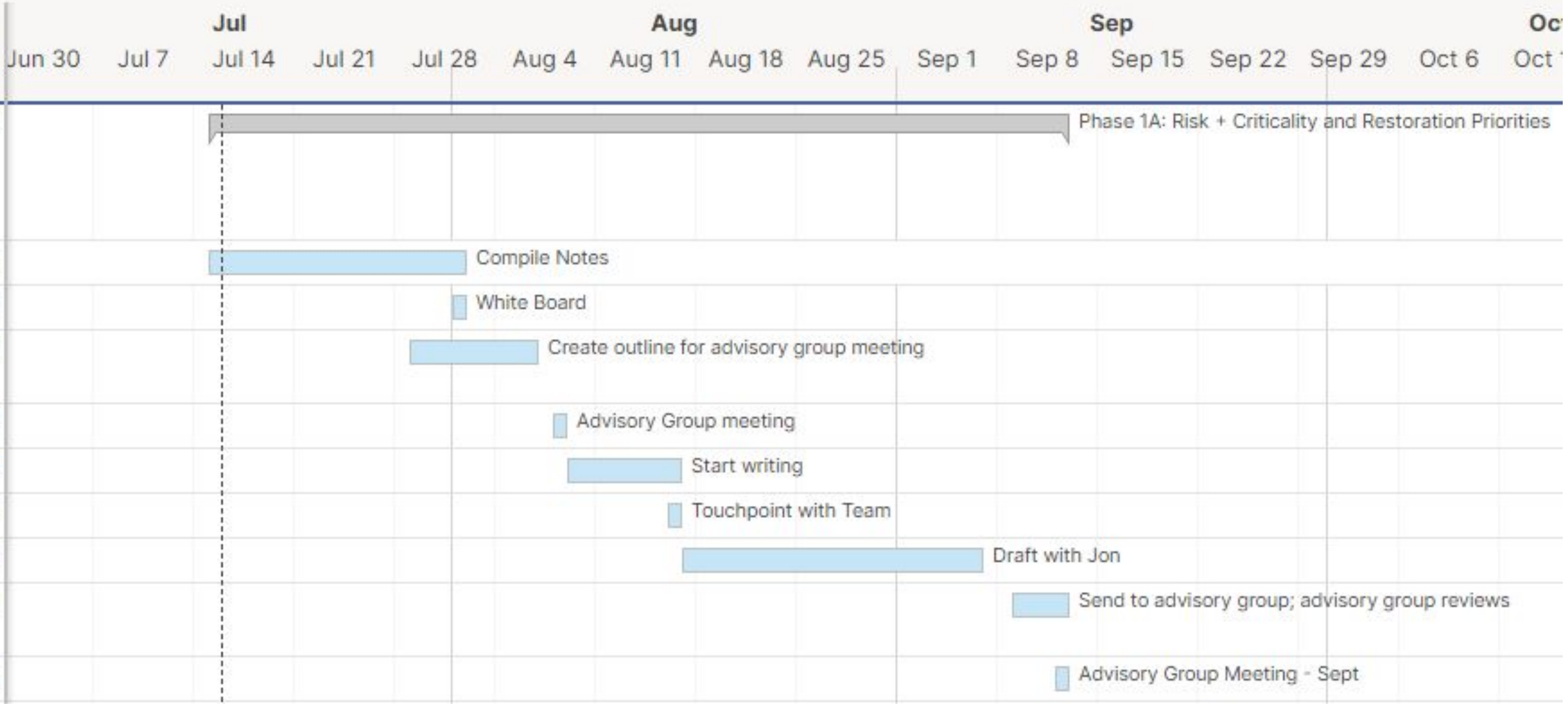
Next Steps

Effort Milestones | Past, Present, + Future

	Data Collection & Interviews	Convene Advisory Group	Project Workshop	Draft Framework	Framework Publication
	Winter 2024	*Spring 2024*	*June 2024*	*Fall 2024*	*Summer 2025*
Objectives	Conduct a landscape analysis of energy security and emergency operations programs.	Scope and design framework concepts with input from the Advisory Group	Facilitate stakeholder conversations and uncover priorities.	Develop first draft of framework using outputs from workshop and Advisory Group meetings.	Incorporate feedback from initial framework draft and subsequent Advisory Group meetings.
Outputs	• Advisory Group List • Report about state energy resilience practices	• 5 framework concepts to discuss at the workshop	• Post-workshop report, including priorities for how to develop framework product	• Initial framework draft	• Finalized Framework

Project Plan

Task	Start Date	End Date	Duration
Phase 1A: Risk + Criticality and Restoration Priorities	07/15/24	09/12/24	44d
Compile Notes	07/15/24	08/01/24	14d
White Board	08/01/24	08/01/24	1d
Create outline for advisory group meeting	07/29/24	08/06/24	7d
★ Advisory Group meeting	08/08/24	08/08/24	1d
Start writing	08/09/24	08/16/24	6d
Touchpoint with Team	08/16/24	08/16/24	1d
Draft with Jon	08/17/24	09/06/24	16d
Send to advisory group; advisory group reviews	09/09/24	09/12/24	4d
Advisory Group Meeting - Sept	09/12/24	09/12/24	1d



Next Steps

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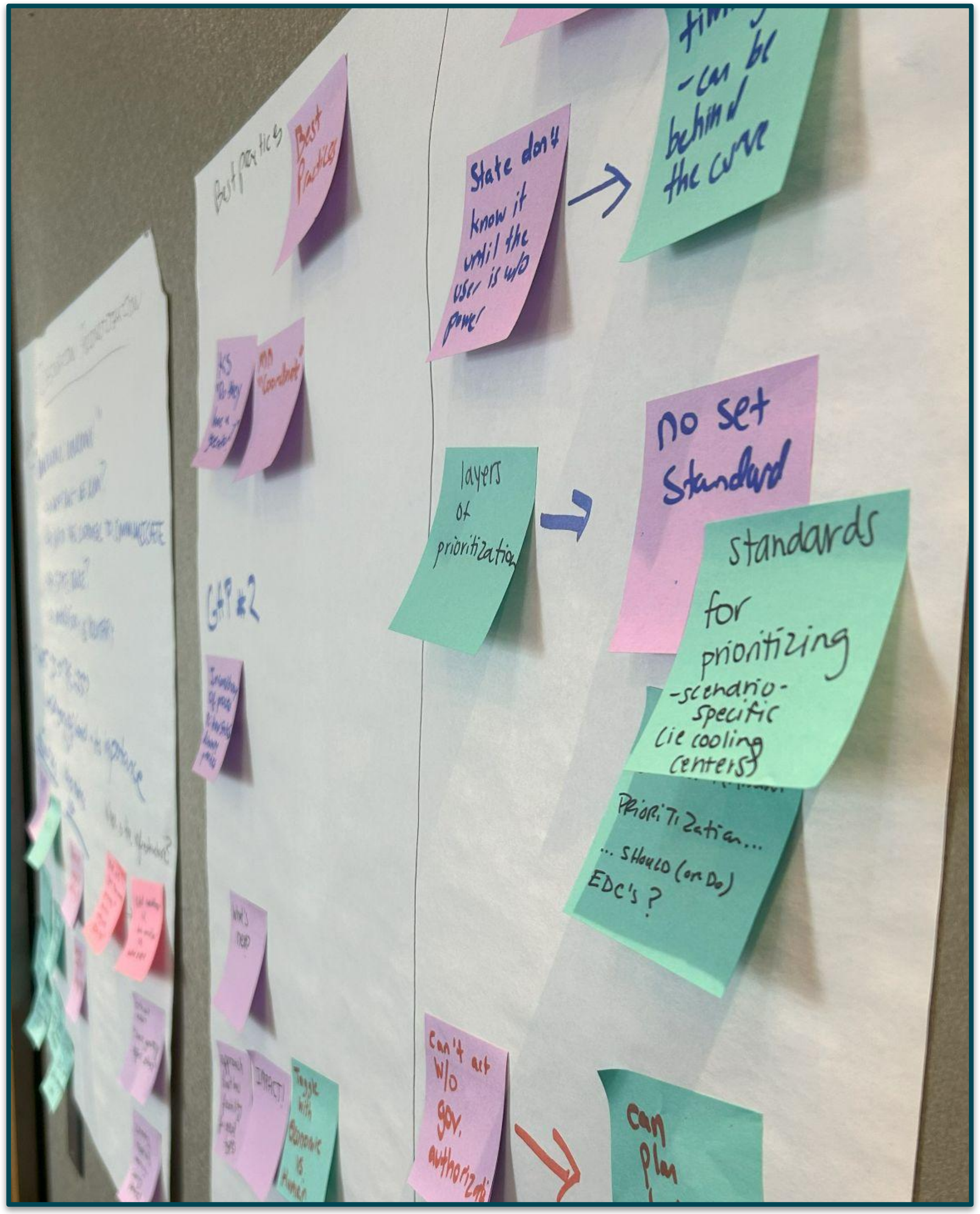
Events + Tasks

1. Today- Monthly Advisory Group Meeting
2. 12 September- Monthly Advisory Group Meeting to review drafts for selected frameworks.
3. Tentative scheduling: next Advisory Group Workshop (in-person); Location: Chicago/TBD
   a. 13-15 November 2024
   b. 20-22 November 2024

Requests for You

1. You can drive communication and next steps. Do you want to continue the discussions from the workshop?
2. Who from your organization should be included in future meetings?



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Appendix A
Framework Presentation Slides

Definition | Restoration Priorities

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Restoration Priorities

Determining **how, when, and to whom energy will be restored,** when considering

- Available emergency response resources
- Risk analysis tools

Framework | Restoration Priorities

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Restoration Priorities

1 Needs

- Review how state agencies, utilities, and ISOs/RTOs share and coordinate response resources and efforts.
- Identify best practices in pre-planned and real-time integrated energy emergency response.
- Identify and align disparate energy restoration prioritization assessments across entities.

2 Examples

- Utility may prioritize restoring a critical electric node rather than an asset serving a certain area of the city, which the state has given restoration priority.
- MISO Power System Restoration Plan.
- Indiana Emergency Operations Plan .

3 Challenges

- How to better understand energy response needs and coordination.
- Achieving alignment with existing multi-sector emergency operations plans (EOPs).

Definition | Energy Risk and Criticality

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Energy Risk

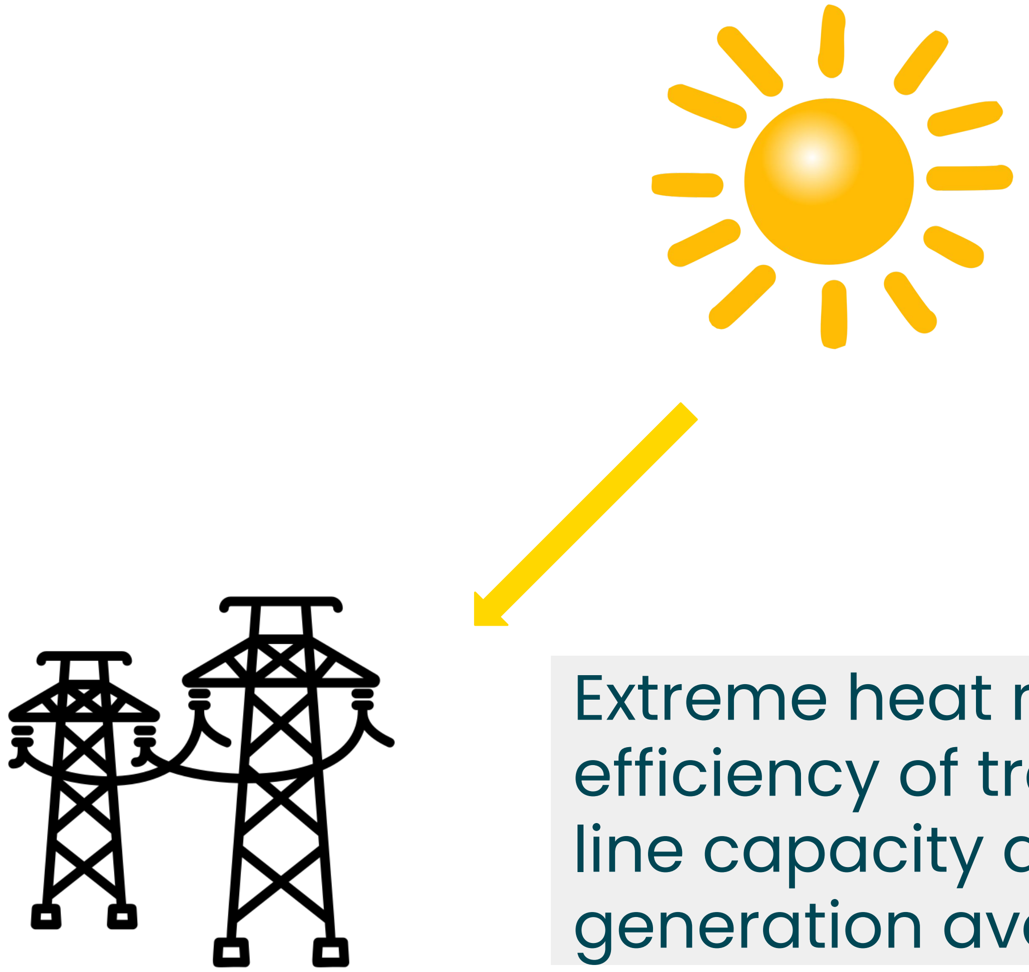
The **potential for energy infrastructure to be impacted by natural and man-made hazards,** as determined through:

- Comprehensive analysis of Interdependencies
- Threat and hazard identification
- Consequences of asset loss.

Criticality

The **criticality of an energy infrastructure asset** is determined by:

- Its relative susceptibility to hazards
- The impacts of its disruption on connected systems
- The presence or lack of redundancy
- The asset's historical performance



Extreme heat reduces efficiency of transmission line capacity and impacts generation availability

Homes, businesses, and critical infrastructure potentially experience loss of power or reliance on backup generators

Framework | Energy Risk and Criticality

Energy Risk and Criticality

1 Questions

- What processes exist for determining how "critical" an energy infrastructure asset is? How do these processes vary among state agencies, utilities, and ISOs/RTOs?
- How are emergency response needs and resources determined and communicated?
- How does risk inform planning and investment?

2 Components

- How states, utilities, and ISOs/RTOs determine risk
- Prioritization of consequences: economic losses, loss of service/infrastructure, and threats to human health and safety
- Understanding how interdepencies in a given area can raise risk levels

3 Challenges

- Determining priorities: understanding how to identify and integrate multiple process to adapt planning, investment, and response to energy emergencies

Definition | Interdependency Planning

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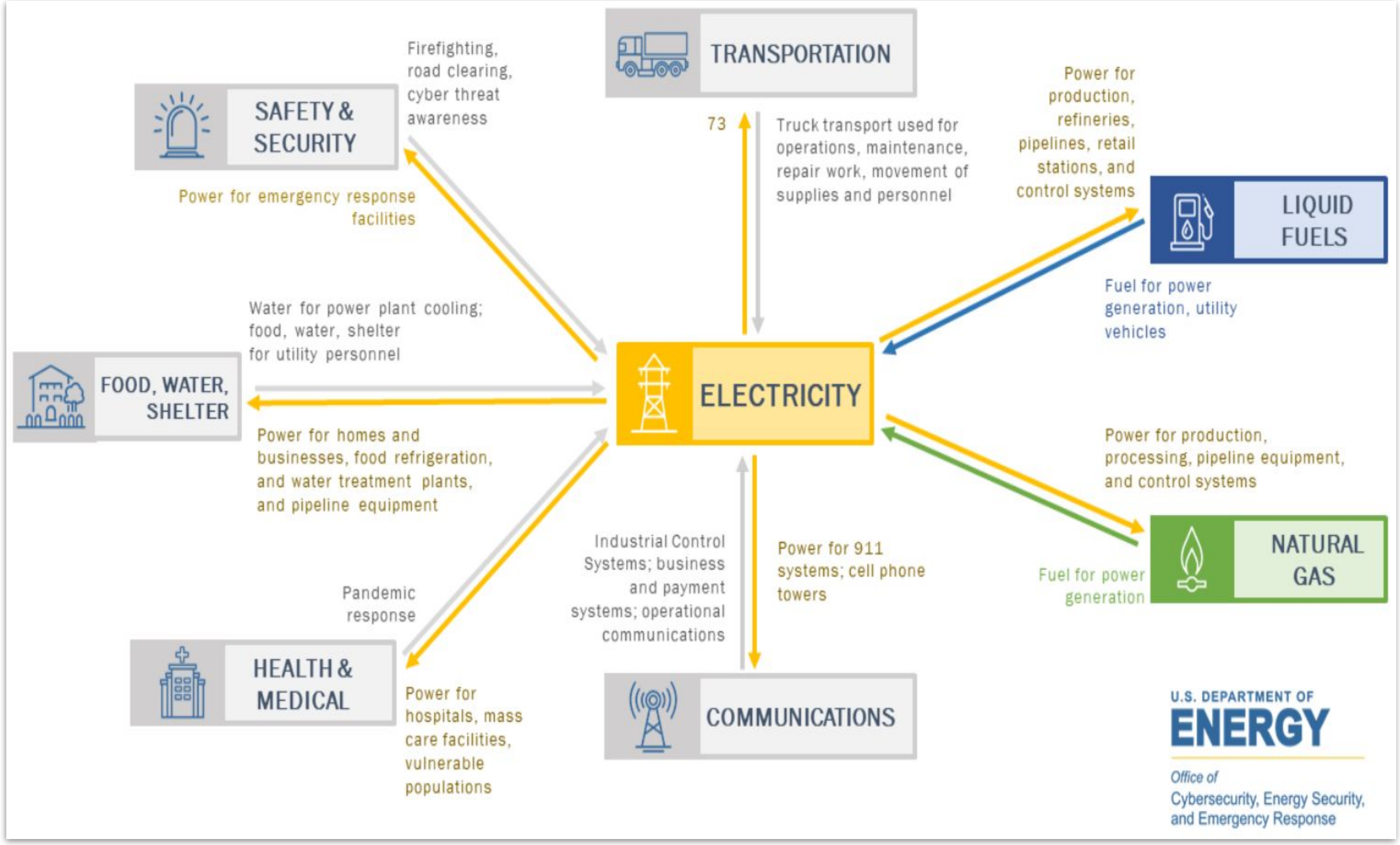
Interdependency Planning

Leaders develop more robust emergency response plans **by understanding the relationship between the energy sector and other sectors (e.g., gas, communications, etc.)**. Successful plans:

- Identify how risk impacts infrastructure different.
- Build an understanding of the cascading effects of disruptions to the energy infrastructure.



Framework | Interdependency Planning

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Interdependency Planning

1 Requirements

- Identify areas of need for cross-sector coordination for emergency response.
- Identify areas of alignment for mitigating risk in cross-sector infrastructure planning.

2 Examples

- Determine how the consequences of a power outage can impact response efforts and priorities.

3 Challenges

- Cross-sector interdependency planning isn't formalized.
- Need to understand how energy sector risk can cause cascading impacts in other sectors.
- Reconciling relationship between restoration priorities, interdependencies, and response efforts.

Definition | Resource Adequacy

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Resource

The mix of available generation assets (e.g., wind power or nuclear energy) **that increase the grid's reliability,** in accordance with energy resilience priorities

Adequacy

The ability of generation capacities to meet load demand during stress events. These are driven by:

- Uniform needs assessments.
- Procedural alignment between states, utilities, and ISOs/RTOs.

States and utilities have differing processes for determining generation needs.

States → Energy policies that align with federal priorities

Utilities, ISOs, & RTOs → Integrated Resource and Long-term Transmission Plans

These processes may drive diverging goals

Ex: State energy policies dictate keeping a coal plant online for emergency back-up that the utility planned to retire.

Framework | Resource Adequacy

Resource Adequacy

1 Capacity

- How much capacity is needed and how is this informed by other energy planning processes?
- How to properly account for variable energy resources?
- What is the right balance for generation assets versus transmission and distribution enhancements?

2 Examples

- Xcel Energy (MN) plans to install small combustion turbines, utility-scale solar+storage, and improve transmission lines instead of building a natural gas combined cycle plant. [1]
- MISO Update to MOPSC acknowledged need for improving regional planning transparency.[2]

3 Challenges

- Significant variance in how states identify and communicate their resource adequacy needs
- How to reconcile interstate resource needs (like a transmission line) with intra-state energy planning priorities

Definition | Design and Integration

Design

The concepts set forth by states, utilities, and ISOs/RTOs **that shape** specific, properly scaled T&D infrastructure design and performance requirements.

Integration

The ability of the infrastructure planning process **to meet or closely align** both state needs, regulations, and utility and ISO/RTO priorities.

Framework | Design and Integration

Design and Integration

1 Requirements

- Determine which planning considerations should be included and prioritized.
- Decide how to mitigate risks from gaps in planning processes or requirements.
- Processes for understanding how utility plans can address state needs and risks.

2 Examples

- State Hazard Mitigation Plans.

3 Challenges

- Understanding how states and utilities adapt and communicate infrastructure planning in a risk-driven approach to investment.
- Align design processes for infrastructure projects that cross state boundaries and have differing priorities.

Appendix B
Other Framework | Overview and Next Steps

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Interdependency Planning

Summary

Interdependency planning helps regions develop robust emergency response plans. Energy is critical to other critical lifelines (e.g., gas or communications). Understanding how these sectors interact with one another is key to achieving regional resilience. This framework will help users establish resilience requirements within their organization and suggest methods for interdependency mapping with external parties.

Gap 1

Visibility

There is a lack of shared knowledge related to critical facility and generation asset reliability. The framework will suggest how to:

1. Use systemic interdependencies to mitigate risk & balance fuel assurance and restoration prioritization issues.
2. Navigate how utilities, states, & regulatory entities view emergency (response) efforts & their roles during emergencies.

Gap 2

Many Dependencies Exist, Making Prioritization Efforts Difficult to Standardize

At the workshop, stakeholders brought up many dependencies, including gas/electric; propane, diesel, & gas fuels; telecommunications & realtime data; water/wastewater; and transportation. The framework will take into account different nuances and will:

1. Consider how unique risks affect the ability to manage the energy system.
2. Focus on energy security.

Best Practices/ Resources

1. Texas bill S.B. 3: Designates critical facilities and set weatherization requirements for facilities, implemented after Winter Storm Uri
2. Federal Power Act (FPA) Section 202(c): Gives DOE authority to control energy facilities and generation during emergencies

Next Steps

1. Provide guidelines to develop a comprehensive interdependency mapping methodology that assists in the identification and prioritization of critical assets.
2. Analyze existing resources to generate a list of best practices that empower stakeholders to establish resilience requirements.

Resource Adequacy

Summary

Resource adequacy is the mix of available generation assets (e.g., wind power) that increases grid reliability, especially during stress events. This can be based on energy resilience priorities and the generation capacities. The framework will create a shared definition and mechanism for understanding resource needs (e.g. increasing regional transfers vs. building new power plant) to meet changing load profiles.

Gap 1

Need for Common Approaches

Resource adequacy can be a function of availability vs. performance (e.g.,. not requiring use of certain energy types, just meeting capacity needs appropriately). The framework will:

1. Help users determine resource needs & attributes between utilities, RTOs, & state levels.
2. Share methods of incentivizing the maintenance or replacement of certain assets.

Gap 2

Transmission

RTOS need to have conversations about resource adequacy and benefits of interregional transfers. The framework will include guidance on the following:

1. How to ensure there is enough generation capacity and mix in an area to meet load needs.
2. Steps for eliminating generator queue issues through media messaging & upgrading existing assets instead of building new ones.

Best Practices/ Resources

1. Use of capacity markets to ensure power is available when needed.
2. Improving connections and conversations around interregional transfers.

Next Steps

1. Outline concepts related to generation resource attributes to better understand how capacity is able to support the critical energy needs of identified state load priorities and how they are impacted by different types of stress events.
2. Examine the ways in which transmission capacity and interregional transfers align with in-state capacity resources.

Design & Integration

Summary

Design & integration is the ability of the infrastructure planning process to meet or closely align both state needs, regulations, and utility and ISO/RTO priorities. These shape properly scaled T&D infrastructure design and performance requirements. The framework will provide guidelines to build uniform infrastructure design criteria that considers multiple disparate organizational priorities.

Gap 1

No Uniform Design Guidelines Currently Exist

Design criteria is determined by resource attributes, independencies, & energy risk levels. The framework will outline:

1. How design affects resilience (or vice versa) will be relative to a specific state's circumstances (i.e. system, location, & utility company).
2. Ways to form design criteria considering: policy, technical, economic, & a combination of all three.

Best Practices/ Resources

1. Consider how rate design will affect design criteria
2. Consider real-world regulations and authorities (e.g. NESC Codes, USDA Rural Utilities Service)

Next Steps

1. Analyze existing infrastructure design criteria and regulations for States, ISO/ RTOs, and utilities to identify areas of alignment or contradiction
2. Develop a framework with policy, technical, and economic consideration for design requirements