Energy and Emergency Planning and Integration Crosswalk (EEPIC)

Energy Risk and Criticality

Energy Risk and Criticality

OVERVIEW

Energy risk and criticality is the potential for energy infrastructure assets to be impacted by natural and man-made hazards, due to asset susceptibility to hazards, impacts of disruption on connected systems, presence or lack of redundancy, and the asset's historical performance.

Understanding energy risk and criticality is important because natural or human-made risks to energy infrastructure affect security, reliability, and resilience. If these risks are determined in disparate, poorly communicated ways, that can cause gaps in planning and resources for many stakeholders. This section aims to enable better communication between government and private stakeholders by suggesting a standardized method for assessing system-level risk.

Outline

HOW TO USE THIS FRAMEWORK SECTION

This module suggests a method of addressing the lack of uniformity in risk assessment methods using a resources called the Consolidated Risk Spectrum. The Consolidated Risk Spectrum, as previewed below, is a four-step process that enables users to build a shared understanding of risk that considers multiple disparate assessment processes. Users are able to use results of Steps 2-4 to assess or understand the best choice for Step 1. Alternatively, the choice in Step 1 can be used to heavily influence decision-making in Steps 2-4.

Step 1 – **Communicating Criticality:** Understand how the Energy Security Strategy chosen in the User Guide affects how you address and communicate energy criticality.

Step 2 – **Risk Assessment:** Consider multiple aspects of risk, such as probability and tolerance, and analyze outcomes of existing risk assessment processes.

Step 3 – **Dimensions of Energy Risk:** Analyze the effects these risks will have on the system.

Step 4 – **Criticality Matrix:** Determine how critical an asset is based on the Dimensions of Energy Risk.

Energy Risk and Criticality

OPPORTUNITY STATEMENT

There is no uniform method for determining risk or the certainty of of energy infrastructure assets. If this alignment were achieved, it would help organizations build a general understanding of how specific circumstances might impact what is considered essential.

To address this challenge, this section will enable users to develop a Consolidated Risk Spectrum. The Consolidated Risk Spectrum is a multi-step process integrating various stakeholder resources. It is focused on defining risk as a strategic concept rather than conducting discrete risk assessments, providing a shared framework to align stakeholder planning efforts and improve translation of state-level priorities into utility risk assessments and their outputs.

GAPS

No Single Method for Assessing Risk	Different organizations—both state agencies and utilities—define and assess risk differently, leading to inconsistent planning approaches and standards across the state. These differences are driven by varying decision-making frameworks, including how organizations prioritize risk (e.g., based on likelihood and impact or the relative cost of mitigation and consequences). Organizational capabilities also shape these approaches, as technical, operational, and financial constraints influence how risks are understood and addressed.
Uncertainty of Service for Critical Functions	The lack of uniform risk assessment methods is further challenged by the lack of clarity regarding service for critical functions. More specifically, there's no uniform method to determine or communicate what makes an asset "critical." This distinction is important because how risk is determined and mitigated directly affects the measure of asset criticality.

MODULE GOALS

Share ideas on what organizations can do after assessing critical infrastructure risk.	Understand the differences between system-level vs. individual risks.
Explain how organizations can define risk for their own critical infrastructure.	Navigate various risk tolerances across multiple entities and assets.
Recommend ways organizations can work together to create a standardized risk assessment process.	Improve methods of identifying and mitigating risk, especially regarding interregional connections.

STEP 1

Communicating Criticality

ENERGY STRATEGY AND CRITICALITY NEXUS

It's important for state officials to understand how their chosen Energy Strategy addresses system criticality and how their decision-making processes might differ from that of infrastructure owner/operators. It's normal for the state to address criticality issues through policy measures, regardless of the chosen energy strategy. Sometimes, this may differ from infrastructure owner/operators and other state offices, who may choose actions that don't fully accomplish state goals. The table below analyzes how how criticality is addressed and implemented through each Energy Strategy.

As suggested in the User Guide, officials are encouraged to choose their energy strategy prior to beginning the Consolidated Risk Spectrum. By doing so, the risk calculation created by the Consolidated Risk Spectrum will be better understood as a result of the desired strategy. However, the strategy can be chosen after conducting the Consolidated Risk Spectrum by analyzing which strategy is the best fit for the results.

Energy Strategy	Definition	How Criticality Is Addressed	Implementation
Diversification	Increase the redundancy of the energy system through scaled, balanced investment to reduce the risk of state dependence on a single energy source, fuel type, or physical asset, that, if left unaddressed, could become a single point of failure in a system.	Ensuring one type of energy source or asset that is susceptible to a particular risk type doesn't dominate system generation capacity by promoting buildout of excess generation assets through financial or regulatory policy initiatives.	Infrastructure owner/operators internally implement renewable energy build out in IRPs to be in compliance with state regulations or supports developers in interconnection processes.
Economics	Prioritizing risk mitigation of certain energy types, assets, or system nodes based on economic contribution.	Identification of nodes or assets that need to be strengthened or hardened due to economic importance (e.g., large loads); or, providing subsidies for an energy type due to its economic/quality of life importance to a community.	Infrastructure owner/operators increase generation capacity, in line with state policies and incentives, to serve and protect new/increased load such as a data center.
Resilience	Strengthening an energy system through the innovative use of technologies, tools, and processes.	Protect the system, assets, or loads from hazards by instituting specific policy measures (e.g., requiring battery storage be paired with all upcoming solar energy projects over a certain megawatt).	Infrastructure owner/operators manage demand challenges on system by implementing demand response measures for energy efficiency.

STEP 2

Risk Assessment

HOLISTIC RISK

This Risk Assessment process builds off existing resources to help users consider multiple aspects of risk, including determining what risks to prioritize as a function of likelihood and impact, identifying the thresholds of acceptable risk to establish mitigation targets, and integrating current government and private sector plans to maximize compatibility. This process focuses on understanding and aligning existing definitions and outcomes, rather than conducting a new or standalone risk assessment.

The type of outage, whether controlled (the deliberate loss of assets) or uncontrolled (the unintended loss of assets), and its cause, such as cold weather, derechos, or floods, can affect risk calculations based on relative severity and asset impacts. These factors shouldn't drive decision-making because the risks themselves are inherently uncontrollable and their mitigation falls primarily to infrastructure owners and operators. State officials should instead focus on what they can control: determining what risks exist, and using policy, regulation, or financial assistance to help identify and communicate them. It is also worth noting that risk may be defined differently across state resources and infrastructure owner planning processes. Users should analyze these differences to identify commonalities that can shape a shared interpretation of risk.

This process requires gathering and analyzing key documents from state offices, including the Threat and Hazard Identification and Risk Assessment (THIRA), State Energy Security Plan (SESP), and others that address infrastructure risk. The following page outlines how to best maximize the Risk Assessment process, including how to best utilize these documents and key factors and questions to consider when analyzing them.

Probability vs. Impact Matrix	+	Risk Tolerance Level	+	Vulnerability and Risk Assessment Outputs	=	Holistic Risk
Integrate risk assessment processes from gov't and private sector to determine what vulnerabilities drive risk (i.e. THIRA, North American Electric Reliability Corporation (NERC) Reliability Assessments).	+	Consider the thresholds for risk mitigation relative to the availability and performance of energy infrastructure and service delivery to meet state energy security priorities.	+	Identify and incorporate the results of current SESPs and Vulnerability and Risk Assessments (VRA) to ensure alignment.	=	Determine how critical an asset is through an understanding of its characteristics.

STEP 2

Risk Assessment

OPTIMIZING THE PROCESS

Components Of The Risk Assessment	How This Informs The Risk Assessment Process	Considerations	Guiding Questions
Probability vs. Impact Matrix	• Resources like the THIRA identify what the state has already highlighted as hazards and can be used to determine impacts to a specific asset. • NERC Reliability Assessments examine overall potential risks and impacts to the system and can be used to better inform analysis of risk probability and impacts to assets.	• How assets are affected by varying risks (e.g., asset is vulnerable to fuel supply challenges but not floods). • The extent to which future risk is considered in present-day assessments. • How impacts of a risk effect interpretation. • How to reconcile resources that identify or interpret risks differently.	• Are there other resources you can use to determine risk or analyze additional ones? • Which is more important: the probability or the impact of a risk?
Risk Tolerance Level	• Influences how individual risks are evaluated and prioritized. • Essentially defines "risk" (i.e., risk threshold is amount of risk you're willing to accept).	• How future potential risk impacts present-day tolerance levels. • Impacts to infrastructure (e.g., resource/fuel availability, lifecycle, etc.). • How risk manifests (e.g., degradation or destruction of system).	• How high can risk tolerance be before system operations are severely degraded? • How might this decision impact asset performance and availability standards in the future? • How is tolerance varying by risk type?
Vulnerability And Risk Assessment Outputs	• SESPs can be used to validate or further analyze results and findings from previous components (e.g., provides risk/hazard profiles and assessment, mitigation measures, etc.).	• How to reconcile different results between SESPs and other resources like THIRA. • Cross-sector impacts.	• What does it mean if a risk is presented multiple times across or within documents? • What if a particular asset (type) is repeatedly affected?

STEP 3

Dimensions of Energy Risk

DRIVERS AND VARIABLES OF RISK

The Dimensions of Energy Risk analyzes the effects four different risk variables can have on the energy system. To conduct this analysis, users will need to understand demographics and asset-specific information, such as its location in the system and (inter)dependencies, much of which can be sourced from utility partners and their planning resources. This will support defining risk, enabling states to better interpret and influence how utilities assess and prioritize risk. This step complements the likelihood-based analysis in Risk Assessment. States must weigh not just how likely a vulnerability is, but also its consequences if realized: a low-probability event with severe consequences can warrant more attention than a frequent one with minimal impact.

The first two risk variables are ***geographic scale*** and ***duration***, which evaluate impacts at a higher level. The second set of variables are ***societal change*** and ***cross sector impact***, which help assess how disruptions affect communities and interconnected systems. Together, they provide a structured way to understand priorities and guide planning decisions. It is important to recognize that risk levels shift depending on context: an outage that is low impact under normal conditions may become high risk during periods of increased demand, and monetary or economic considerations, such as the costs of disruption, can further elevate the severity of certain impacts.

To better aid users in their analysis of what drives risk across their energy system, the following pages detail each of the variables and their characteristics. The variable's risk levels are color-coded in green, yellow, and red to denote low (1), medium (2), and high (3) risk, respectively. The overall risk level is the average of all four variable scores, where low risk is ≤1.5; medium is between 1.51 and 2.4; and high is ≥2.5. These color designations, seen below, will be useful in analyzing the results of the Consolidated Risk Spectrum.

Variable #1: Geographic Scale

Evaluate how the impacts of risk increase in proportion to the scale of the energy systems impacted in an event.

Variable #2: Duration

Assess thresholds for time-driven disruptions that result in cascading impacts to people and interdependent systems.

Variable #3: Societal Change

Understand the severity of impact based on three tiers:
1) Population Vulnerability
2) Public Health/Safety
3) Potential for Permanent Relocation

Variable #4: Cross Sector Impact

Crosswalk the FEMA Community Lifelines to assess the extent of multi-sector impacts due to asset or system degradation, disruption, or destruction.

Low Risk	Medium Risk	High Risk

STEP 3

Dimensions of Energy Risk

VARIABLE 1: GEOGRAPHIC SCALE

Risks to infrastructure impact the energy system differently depending on the level of the system the asset lies on. Understanding these risks allows for better determination of the actions that should be taken to mitigate them. There are three main levels of scale along the energy system to consider: local (distribution infrastructure), state (transmission and generation), and multi-jurisdictional (regional bulk electric system (BES)).

The table below provides examples of how low, medium, and high risks to assets can impact the system at each grid level. Each risk level provides further examples of what types of risk exist and the ways in which they impact energy systems. Note that while low levels of risk have little effect on the energy system, particularly at the local level, high risk levels can drive increased costs, losses, and resource demands.

	Asset Risk Level		
System Level	**Low** *Maintenance issues, localized outages, slight changes in supply and demand, supply chain delays, accidents.*	**Medium** *Critical equipment failure, environmental events, regional demand spikes, cybersecurity, policy change.*	**High** *Large-scale environmental events, cybersecurity or physical attacks, resource scarcity, safety incidents, significant policy change.*
Local	Brief, localized outages impact community lifelines and functions. Delays in maintenance; may cause significant issues over time.	Harm businesses and quality of life. Little to no redundancy if asset becomes inoperable; can stress wider system.	Devastation of communities, particularly over long periods (e.g., blackouts, damage, hazards like pipeline explosion).
State	Frequent/repeating issues on individual assets may impact compliance and overall cost for operators.	Physical harm to people and equipment. Needs for replacements and upgrades cause serious disruptions to energy delivery.	Widespread outages and economic loss. Impedes emergency response and impacts other infrastructure systems.
Multi-jurisdictional	Minimal impact, even when aggregated, due to size and interconnectedness of systems.	Reliance on interregional transfers, assuming connections work or exist. Cost/price volatility.	Stress to regional and national grid can impede interregional transfers and economics (e.g., factories can't produce export goods).

STEP 3

Dimensions of Energy Risk

VARIABLE 2: DURATION

The length of time a grid asset is inoperable can seriously impact the performance of other grid assets within a connected system, including the energy customers the asset serves. Longer duration outage events can significantly increase economic and societal consequences as performance degrades over time. The minimum acceptable duration of an asset being inoperable represents its criticality to the system.

Duration is broken into three timeblocks: 6-24 hours; 24-72 hours; and over 72 hours. Each time frame carries its own set of corresponding impacts to people, operations, and physical infrastructure as a result of the extended power outage. While there may be common themes between the timeblocks, the severity of the effects and impacts increase with the outage duration.

Utilize the diagram below to analyze and understand the risk of an extended outage. Consider:

- What energy customers and connected infrastructure depend on that asset's operation, and what happens to them when electricity service is lost?
- How do these timelines affect state priorities for energy emergency response planning?
- How are compounding financial impacts affecting the risk level?

	Effects	Impacts to Infrastructure
6-24 Hours	Common timeframe primarily impacting quality of life (e.g., loss of home energy, businesses). Minor health & safety concerns (e.g., food spoilage, electrical medical equipment).	Backup battery on communications towers last ~8 hours, restricting time for power restoration. Reliance on backup generation, if equipped.
24-72+ Hours	Moderate impacts to health & safety, economics, and infrastructure (e.g., certain functions cease due to lack of power, loss of communications). Extended planning/resources may be required to protect and provide for the population.	Typical stored fuel for backup generation is only enough for ~72 hours and may begin to run out, depending on use. Long term impacts to non-operating infrastructure (e.g., bacteria at wastewater treatment plant die if not "fed").
72+ Hours	Severe impacts to population health & safety and economics (e.g., businesses close, slow/no transportation, poor/low medical care access). Property damage due to lack of heating/cooling.	Outages over this timeframe are eligible for federal assistance. Requires extensive coordination across sectors and organizations to restore the system safely.

STEP 3

Dimensions of Energy Risk

VARIABLE 3: SOCIETAL IMPACT

Energy is one of the most important tools we have to sustain societal functions. While numerous modeling tools exist to help us understand the technical underpinnings of losing a grid asset, **Societal Impact** helps interpret how the loss of electrical service can affect the essential services people rely on. **Societal Impact** is divided into the three categories below: Population Vulnerability, which primarily deals with quality of life; Public Health and Safety; and Permanent Relocation/Mass Migration, which describes the longer-lasting socioeconomic impacts of outages.

This variable should be used to interpret how asset loss translates into broader societal risk, enabling users to poritoritize planning efforts. Notice below how the severity increases across these categories, demonstrating how disruptions can escalate from immediate service impacts to long-term societal consequences. This progression helps users evaluate both direct effects and their impacts over time.

Population Vulnerability

Endangers public safety through slow or absent transit options. Safety enforcement resources, like law enforcement officers (LEOs), may be engaged in other activities.

Impacted quality of life (e.g., economic well being, loss of electricity for food storage, medical supplies, essential services).

Public Health & Safety

Disruptions to medical facilities including hospitals, nursing homes, and pharmacies can result in poor quality medical care or the complete loss of services.

Water infrastructure may also be affected, leading to reduced access to potable water, causing the spread of infectious diseases.

Permanent Relocation/Mass Migration

Businesses closing due to extended power outages undercuts financial stability, resulting in job losses for the local population and long-term losses of tax revenue for governments.

Long and/or recurring outages cause pre-existing business to permanently close and deter future investment in communities.

STEP 3

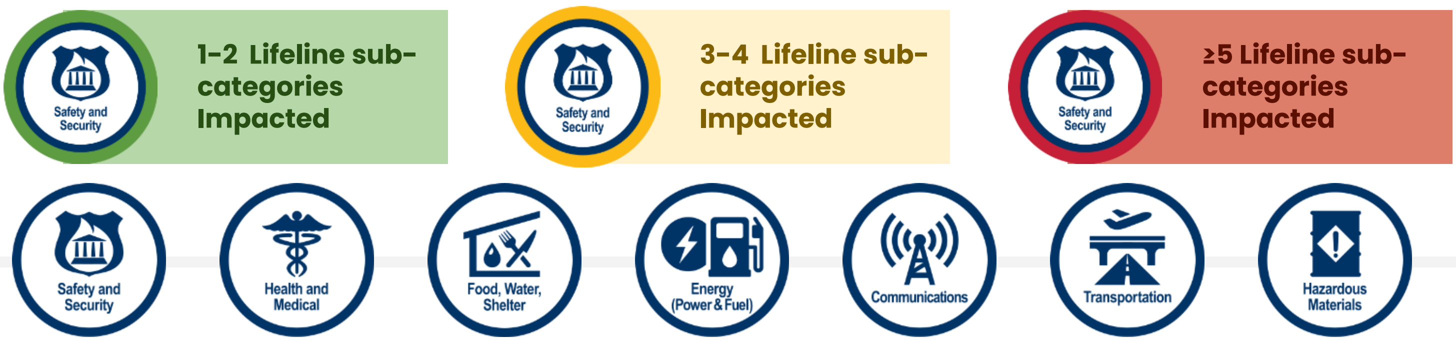
Dimensions of Energy Risk

VARIABLE 4: CROSS SECTOR IMPACTS

As previously discussed, energy is utilized is almost every aspect of our daily lives, and numerous critical systems (e.g., transportation, communication, and health) are dependent on energy. When the loss of an asset prevents energy transmission, the effects reverberate across multiple sectors.

The final variable of the Dimensions of Energy Risk analyzes cross sector impacts **Cross Sector Impacts** using the FEMA Community Lifelines to understand the cross sector role of an asset and its effects on communities and the system. Below, the diagram shows the increasing severity of risk when more than one Lifeline is affected. Note that this section is agnostic to which specific lifeline is affected. However, outside of this process, users are encouraged to conduct further analysis of the subcategories in each lifeline to gain full understanding of the risks to other sectors.

Users should refer to Annex A for the full list of the FEMA Community Lifelines.



EXAMPLE: DETERMINING DRIVERS OF RISK

Step 3 of the Consolidated Risk Spectrum identifies what is driving the state's risk calculations. The table to the left demonstrates how to interpret the results using the example of an asset operating in cold weather. Each variable's risk is scored on a three-point scale-high (3), medium (2), or low (1)- with the overall risk level being the average of all four scores.

The primary risk driver is the regional scale of impact from the loss of this asset (high). While the outage duration is relatively short-term (medium), few people and critical sectors are affected (low). Per the average of these scores (1.75), this asset's overall risk level is medium (2).

Scenario: Cold Snap

Scale	Local T&D	BES	Regional
Duration	<24 Hours	24-72 Hours	72+ Hours
Population	Vulnerable	Health & Safety	Mass Migration
Cross-Sector	1-2 Lifelines	3-4 Lifelines	≥5 Lifelines

Risk Level: Medium

STEP 4

Criticality Matrix

INTEGRATING RISK METHODS

The Criticality Matrix is the final step in the Consolidated Risk Spectrum. Here, users determine how critical an energy asset is relative to other infrastructure by identifying and assessing its overall risk and performance as part of the larger energy system. This calculation is not solely about scoring assets, but about determining the contributing factors in forming a risk definition. To best complete this matrix, users may need to work with infrastructure owner/operators to gather data on resources and historical performance of assets. The process described in the following pages is not prescriptive and users should feel welcome to adjust the process to suit their needs.

The first step of the matrix is to gather findings and external resources from the Consolidated Risk Matrix, to be used as inputs to the matrix. Then, using the example questions below, analyze the findings from both the Risk Assessment (Step 2) and Dimensions of Energy Risk (Step 3). Finally, using data regarding infrastructure performance and resources, analyze the performance of the asset.

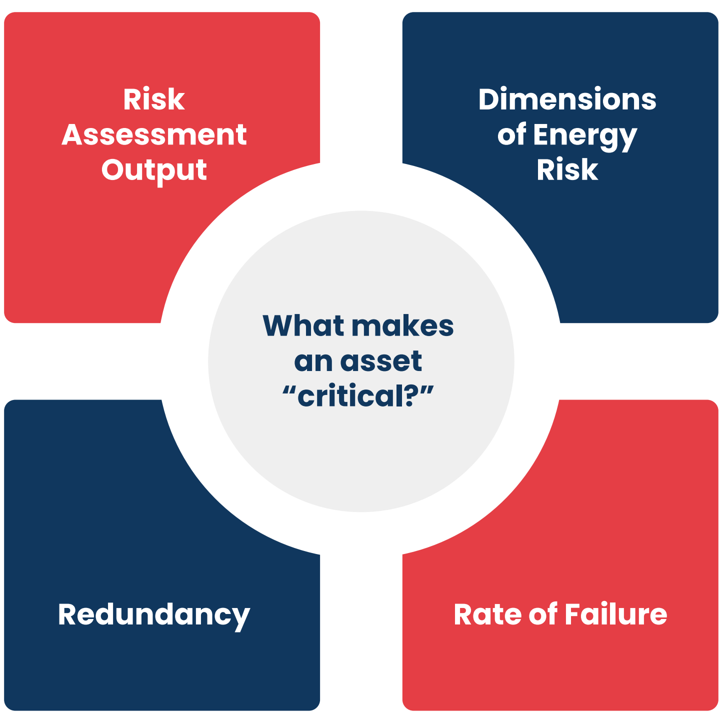
The Criticality Matrix utilizes a three-point system, symbolizing low (1), medium (2), or high (3) risk, which is used to rank the findings of each category, and includes the previous risk level of the Dimensions of Energy Risk. Using this scoring system, a high-capacity generation asset with limited or no comparable asset would indicate a high redundancy risk score (3). The points for each category should be added together to determine the criticality of the asset, with a score limit of 12. These scores should be interpreted as indicators of how risk is defined and prioritized, rather than a precise measurement. In general, an asset is Critical if the total score is 10 or more. The following page provides a table for calculating risk levels across each category.

Susceptibility to Risk

What was the outcome of the risk assessment? An asset with a high likelihood of experiencing a risk that you can't reasonably tolerate should be rated as highly critical.

Risk Drivers

What is the primary aspect of risk? Does the asset serve a densely populated area? Is it an important regional asset? Would it take a long time to repair or replace?



Single Point of Failure

Can the functions on this asset be supplemented or replaced by another resource, asset, or capability with minimal impact?

Historical Performance

What is this asset's historical performance? What stage of lifecycle is this asset in? Think about what risks an aged asset poses to system operations.

STEP 4

Criticality Matrix

USING THE CRITICALITY MATRIX

Below is the scoring method for understanding the results of the Criticality Matrix for both individual assets (based on the average score created in Step 3) and the overall score (the total of the four scores).

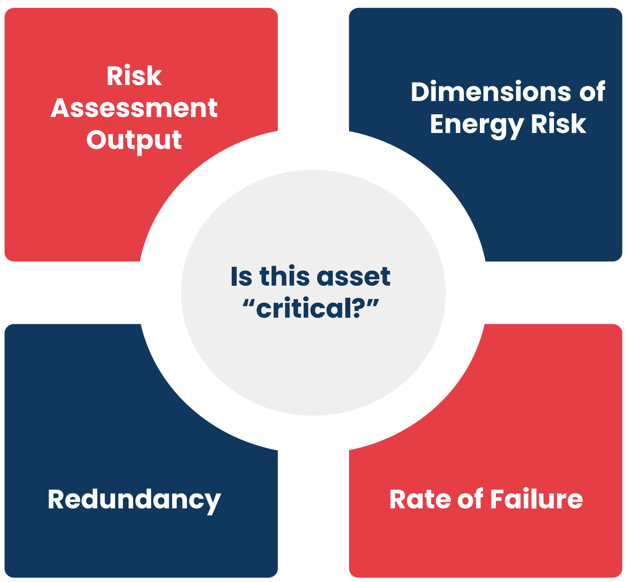
Individual Asset Score (Dimensions of Energy Risk)	**Low Risk *(1)***	**Medium Risk *(2)***		**High Risk *(3)***
Criticality Score (Total Added)	**Low *(4-5)***	**Medium *(6-7)***	**Moderate *(8-9)***	***Critical (10-12)***

EXAMPLE: DETERMINING CRITICALITY

Below is an example of how to best conduct the Criticality Matrix using the example of a large solar farm built for the primary benefit of supporting a new data center campus.

The solar farm is inherently variable. If lost, the data center can use back-up generation. However, the loss of the solar farm can have other effects for meeting demand across the system.

The loss of the solar farm can impact multiple communities. An extended outage can increase reliance on backup and other system resources to meet demand and disrupt digital services.



This is a high capacity asset with a high capacity factor. If lost, utilities may need to dispatch higher-cost resources or shift system priorities to maintain reliability.

This asset is fairly new and has never failed.

	Risk Assessment Output	Dimensions of Energy Risk	Redundancy	Rate of Failure	Criticality Score
Score	2	3	2	1	8

Result

This asset criticality score is "moderate" due to its medium risk assessment score, the existence of unfavorable but redundant assets, and nonexistent rate of failure. **However,** it is still critical and poses a high risk to the system due to its risk drivers, particularly its extensive cross sector and geographical scale impact.

STEP 4

Consolidated Risk Spectrum

UNDERSTANDING THE CONSOLIDATED RISK SPECTRUM

The final step of the Consolidated Risk Spectrum is to analyze and interpret the inputs of each step to understand the results of the overall risk assessment. This will allow officials to do two things. First, this process produces a common understanding of what ***risk*** means and how it is defined. Secondly, this new definition can be used to communicate to utilities what energy issues the state is concerned about and how it wants to address them. The table below helps officials better interpret the meaning behind the inputs in each step of the Consolidated Risk Spectrum process. However, this table is not prescriptive and should be used as a guiding tool during and after the analysis and scoring process.

	Risk Level		
Consolidated Risk Spectrum	**Low**	**Medium**	**High**
Energy Security Strategy	Chosen strategy existed in policy prior to conducting module and is already implemented or in progress; Further efforts will improve existing plans and likely will not require significant, new resources.	Chosen strategy existed in policy to some degree prior to conducting module and is partially implemented or in progress; Further efforts will improve plans or take new direction, likely requiring new resources.	Chosen strategy did not exist prior to module; All efforts to achieve the strategy will require significant resources.
Risk Assessment	Common definition of ***risk*** exists between state and utilities; low probability of risk, or risks are known and already mitigated (e.g., state is prone to flooding and regs. already exist); Risk tolerance is appropriate for existing vulnerabilities.	Some common definition of ***risk*** exists; several risk types aren't mitigated, leaving asset(s) vulnerable; General lack of alignment between different risk assessment processes; Risk tolerance may need to lower across key vulnerabilities.	Disparate definitions of ***risk*** exist across state, utilities, and risk assessment processes; Existing risks are not or are inadequately mitigated; Risk tolerance is higher than appropriate for existing vulnerabilities.
Dimensions of Energy Risk	Low/minimal risks to the system that are either easily mitigated or are already mitigated through existing policy or regulation; Further efforts to protect system will be based on improvements.	Notable risks to the system are identified, and mitigations will need to be identified or strengthened through existing policy or regulation.	Severe risks to the system that are not currently or thoroughly mitigated; Concentrated efforts in policy and regulation are needed to address challenges.
Criticality Matrix	Asset(s) deemed not critical due to low risks identified across all categories.	Asset(s) deemed critical due to moderate to severe risks across at least 1-2 categories; Requires stakeholder engagement and some policy or regulatory changes.	Asset(s) deemed critical due to high level of risk across at least 3 categories; Requires extensive stakeholder engagement and policy or regulatory changes.

Resource Adequacy Nexus

RISK-DRIVEN PLANNING

Energy risk and criticality and resource adequacy are closely related issues that can significantly impact the performance of the energy system. To mitigate these risks, effective resource planning is essential to ensure that load demands can be met. This approach not only improves the performance of assets but also increases the diversity of generation resources and redundancy. The risk assessment conducted in this module aids in identifying which of the assets require further attention.

A key aspect of understanding an asset's criticality is to determine its historical performance and the presence of backups that can match its generation contribution to the system. If an asset is failing in these attributes, then conversations around resource adequacy become crucial. In particular, you should address how to incentivize infrastructure owner/operators to replace or perform maintenance on the asset, which mitigates the risk this asset poses to the system.

During conversations about resource adequacy, many officials and infrastructure owner/operators point to interregional transfers and transmission as the best solution to managing energy supply and demand needs. However, it's important that assets which play major roles in the bulk electric and/or regional systems are thoroughly assessed for any risks they may pose or be affected by.

For example, an aging fossil fuel power plant located in a storm-prone area and serves several critical loads, including a military base—it is a high risk and a critical asset. If weather challenges caused it to fail without sufficient backups, there would be detrimental cascading impacts across the system. This module is designed to help identify these kinds of issues and communicate the need for appropriate resource planning to make the system less reliant on these kinds of assets.

What does it look like in practice?

Identification of Problem

An aging, outage prone natural gas plant exists in the central but rural part of the state. The closer it gets to full capacity, the more it breaks. Meanwhile, several assets (fossil fuels and DER) are either in utility connection queues across the state or are being built.

Solutions Brainstorming

Two problems exist: a poorly maintained asset and a large generation queue. It's determined that state policy should support prioritizing assets in queue that'll serve critical loads/nodes, particularly the one in question, and allow for rate increase to support the cost of maintenance on the natural gas plant.

Impact on Systems & Policy

State mitigates risks to the energy system, both broadly and to the natural gas plant itself, by ensuring generation assets can access and provide service to the grid.

While this example leans towards a ***resilience*** strategy, more work can be done by users to ensure methods validate the chosen security strategy.