FINAL

ATTACHMENT 4

2022 Maturity Model
Office of Energy Infrastructure Safety

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INTRODUCTION

Approach to the Utility Wildfire Mitigation Maturity Assessment
The Utility Wildfire Mitigation Maturity Model is a method to assess utilities' wildfire risk-reduction capabilities and examine the relative maturity of the utilities' wildfire mitigation programs. When leveraged with requirements to increase maturity over time, the maturity assessment can be used to drive continuous improvement in utility wildfire mitigation. Implementation of the maturity assessment will help to identify and share best practices among the utilities and to establish a continually improving suite of best practices and lessons learned to combat the growing risk of utility-related wildfires.

This assessment evaluates the utility's maturity in its capacity to address wildfire risk. The maturity assessment is not designed to assess performance or regulatory compliance, which are assessed separately. The Office of Energy Infrastructure Safety (Energy Safety) intends to apply the maturity assessment to track each utility's maturity using the following process:

1. **Similar to 2021, Energy Safety intends to assess 2022 progress on maturity** by comparing the utility's progress from 2020 and 2021 maturity using self-reported data—subject to verification—from the utility's responses on the Maturity Survey, its Wildfire Mitigation Plan (WMP), and other relevant data sources. Energy Safety requires each utility to complete an annual Maturity Survey to report on its current capabilities and plans for improvement in those capabilities.
2. **Energy Safety intends to score the utility's projected maturity** over the plan cycle, assuming full implementation of each of the elements of the utility's WMP. Energy Safety intends to evaluate each utility's maturity based on three data sources: the utility's Maturity Survey response, responses to additional data requests, and the utility's other submissions, including its WMP/WMP Update.
3. **After evaluating each utility's WMP or WMP Update, Energy Safety intends to annually re-evaluate each utility's maturity** to track progress against WMP-projected maturity.
4. **Finally, every three years, the Maturity Model rubric** is expected to be updated to drive continuous improvement over the long term. Energy Safety may periodically adjust the scale and re-define the maturity scoring such that there is room for utilities to continuously improve. For example, a utility that improves on the scale from a 1 (meets minimum expectations) to a 4 (improvement over current best practices) should continue to improve over time. In contrast, a utility that scores a 3 should not expect the same score in the future without further improvements.

The maturity assessment scores each utility against a total of 52 capabilities, organized in 10 categories. A high-level summary of each capability is provided below. Each capability is scored into one of five possible levels of maturity. Table 1 provides a more detailed description of each capability being assessed.

	Category	I. Capability	II. Capability	III. Capability	IV. Capability	V. Capability	VI. Capability
	A. Risk assessment and mapping	1. Climate scenario modeling	2. Ignition risk estimation	3. Estimation of wildfire consequences for communities	4. Estimation of wildfire and PSPS[1] risk-reduction impact	5. Risk maps and simulation algorithms	
	B. Situational awareness and forecasting	6. Weather variables collected	7. Weather data resolution	8. Weather forecasting ability	9. External sources used in weather forecasting	10. Wildfire detection processes and capabilities	
	C. Grid design and system hardening	11. Approach to prioritizing initiatives across territory	12. Grid design for minimizing ignition risk	13. Grid design for resiliency and minimizing PSPS	14. Risk-based grid hardening and cost efficiency	15. Grid design and asset innovation	
	D. Asset management and inspections	16. Asset inventory and condition assessments	17. Asset inspection cycle	18. Asset inspection effectiveness	19. Asset maintenance and repair	20. QA/QC for asset management	
	E. Vegetation management and inspections	21. Vegetation inventory and condition assessments	22. Vegetation inspection cycle	23. Vegetation inspection effectiveness	24. Vegetation grow-in mitigation	25. Vegetation fall-in mitigation	26. QA/QC for vegetation management
	F. Grid operations and protocols	27. Protective equipment and device settings	28. Incorporating ignition risk factors in grid control	29. PSPS op. model and consequence mitigation	30. Protocols for PSPS initiation	31. Protocols for PSPS re-energization	32. Ignition prevention and suppression
	G. Data governance	33. Data collection and curation	34. Data transparency and analytics	35. Risk event tracking	36. Data sharing with research community		
	H. Resource allocation methodology	37. Scenario analysis across different risk levels	38. Presentation of relative risk spend efficiency for portfolio of initiatives	39. Process for determining risk spend efficiency of vegetation management initiatives	40. Process for determining risk spend efficiency of system hardening initiatives	41. Portfolio-wide initiative allocation methodology	42. Portfolio-wide innovation in new wildfire initiatives
	I. Emergency planning and preparedness	43. Wildfire plan integrated with overall disaster/ emergency plan	44. Plan to restore service after wildfire related outage	45. Emergency community engagement	46. Protocols in place to learn from wildfire events	47. Processes for continuous improvement after wildfire and PSPS	

[1] PSPS: Public Safety Power Shutoff, also called de-energization.

	Category	I. Capability	II. Capability	III. Capability	IV. Capability	V. Capability	VI. Capability
				during and after wildfire			
	J. Stakeholder cooperation and community engagement	48. Cooperation and best practice sharing with other utilities	49. Engagement with communities on utility wildfire mitigation initiatives	50. Engagement with AFN populations	51. Collaboration with emergency response agencies	52. Collaboration on wildfire mitigation planning with stakeholders	

SUMMARY DESCRIPTIONS OF CAPABILITIES

Below are summary descriptions of each Maturity Model capability, organized by category. In the sections following, each category is listed with its underlying capabilities and their descriptions.

Table 1: Description of capabilities

Category	Capability	Capability description
A. Risk mapping and simulation	1. Climate scenario modeling and sensitivities	For planning purposes, the ability of the utility to reliably model various climate scenarios. The ability to understand how changing weather patterns impact wildfire and Public Safety Power Shutoff (PSPS) risk across their grid. Higher scores are achieved for incorporating a wider range of inputs and having more granularity.
	2. Ignition risk estimation	Having tools and capabilities to assess ignition risk across the utility's grid based on the combination of electric lines and equipment, vegetation, and weather/climate. Higher scores are achieved for having greater automation, and for using tools that take into account a wide range of variables to more accurately estimate ignition risk.
	3. Estimation of wildfire consequences for communities	Having tools and capabilities to assess how communities would be affected in the instance of an ignition. Higher scores are achieved for having more highly automated tools that take into account more variables and more granular data to accurately estimate the consequence of wildfire.
	4. Estimation of wildfire and PSPS risk-reduction impact	The ability of the utility to estimate the consequence of various initiatives in reducing wildfire and PSPS risk to communities. Higher scores are achieved for being able to estimate risk reduction at a more granular level and for taking into account the specific existing lines and equipment, vegetation, weather/climate, and other factors specific to the location in which the initiative is being undertaken.
	5. Risk maps and simulation algorithms	The establishment of processes to update risk maps and wildfire simulation algorithms based on differences between modeled estimates and measured results. Higher scores are achieved by having more robust mechanisms for detecting differences and for more frequent updates.

Category	Capability	Capability description
B. Situational awareness and forecasting	6. Weather variables collected	The completeness of weather data variables collected. Higher scores are achieved by collecting a greater scope of reliable and relevant weather data and having more processes to validate the readings on each of these variables.
	7. Weather data resolution	The spatial and temporal resolution with which relevant weather data is collected, with higher scores achieved for collecting more data at a resolution that helps the utility understand the specific conditions at a finer resolution across the grid and over time.
	8. Weather forecasting ability	The ability of the utility to accurately predict weather across its grid. Higher scores are assigned to utilities that are able to forecast more accurately, at higher spatial and temporal resolution, and at a longer range.
	9. External sources used in weather forecasting	The external sources and validation processes the utility uses to obtain and validate its weather data. Higher scores are assigned to utilities that use external weather data to error check utility collected data.
	10. Wildfire detection processes and capabilities	The ability of utilities to detect ignitions and wildfire within their territory, particularly along the utility's lines and equipment. Higher scores are assigned to utilities with greater automation in their detection process and having more means of detection.
C. Grid design and system hardening	11. Approach to prioritizing initiatives across territory	The effectiveness of the utility's approach to prioritizing initiatives in the areas along their grid that would most benefit from wildfire and PSPS risk-reduction initiatives. Higher scores are assigned to utilities that can prioritize geographically at a higher granularity and take into account the evolving impact on communities and the surrounding environment.
	12. Grid design for minimizing ignition risk	The parameters of the utility's grid that minimize ignition risk. Higher scores are assigned to utilities having strategic grid design and localization (e.g., including implementing

Category	Capability	Capability description
		solutions such as microgrids and minigrids, as well as having geographically targeted hardening initiatives and locating lines away from highest risk areas of landscape).
	13. Grid design for resiliency and minimizing PSPS	The level of redundancy and resilience in the utility's grid that reduces the occurrence of depriving customers of electricity, should a line be de-energized, and to confine any PSPS impacts to a limited number of customers. Higher scores are assigned to utilities with more redundant grid topologies and for greater sectionalization.
	14. Risk-based grid hardening and cost efficiency	The degree to which the utility's grid is built using ignition prevention equipment. Higher scores are assigned to utilities that use more ignition prevention equipment with higher risk-spend efficiency.
	15. Grid design and asset innovation	The utility's program to evaluate and develop new design and hardening initiatives. Higher scores are assigned to utilities that have more robust processes for evaluating new technologies and evaluating the risk-spend efficiency of the technologies.
D. Asset management and inspections	16. Asset inventory and condition assessments	Having an accurate inventory or database of utility lines and equipment by asset type across the grid, as well as the condition of each component. Higher scores are achieved by recording more wildfire-related attributes of each piece of equipment with greater frequency.
	17. Asset inspection cycle	How the utility determines the cycle with which inspections of the utility's grid are conducted. Higher scores are achieved by understanding equipment failure probability and timing inspections accordingly to maximize risk mitigation efficacy.
	18. Asset inspection effectiveness	The depth and detail to which inspections are performed and recorded. Higher scores are achieved by having greater ability to identify higher risk areas and assets and conducting more

Category	Capability	Capability description
		in-depth inspections to maximize risk mitigation efficacy.
	19. Asset maintenance and repair	The approach taken by the utility to maintain and repair equipment in higher risk areas. Higher scores are assigned to utilities that maintain equipment in better condition in areas with the highest wildfire risk.
	20. QA/QC for asset management	Having established processes for monitoring the quality of inspection and maintenance work across the grid. Higher scores are achieved for having robust processes and trainings, and also for using technologies to monitor and validate work performed.
E. Vegetation management and inspection	21. Vegetation inventory and condition assessments	Having an accurate inventory or database of vegetation along rights of way and vegetation with strike potential, including the condition of each vegetation. Higher scores are achieved by having more granular information and a more up-to-date database.
	22. Vegetation inspection cycle	How the utility determines the cycle with which vegetation inspections are conducted. Higher scores are achieved by understanding vegetation growth, characteristics, and failure probability and timing inspections accordingly to maximize risk mitigation efficacy.
	23. Vegetation inspection effectiveness	The depth and detail to which inspections are performed and recorded. Higher scores are achieved by having a greater ability to identify higher risk areas and vegetation and conducting more in-depth inspections to maximize risk mitigation efficacy.
	24. Vegetation grow-in mitigation	The utility's standards and actions for treating vegetation that has grow-in potential around lines and equipment. Higher scores are assigned to utilities that use ignition risk modeling and vegetation growth rates to determine appropriate vegetation clearances and trim cycles.

Category	Capability	Capability description
	25. Vegetation fall-in mitigation	The utility's processes for treating vegetation that has strike potential on its grid. Higher scores are assigned to utilities that treat vegetation based on a granular understanding of individual vegetation strike potential.
	26. QA/QC for vegetation management	Having established processes for monitoring the quality of inspection and treatment work across the grid. Higher scores are achieved for having robust processes and trainings, and also for using technologies to monitor and validate work performed.
F. Grid operations and protocols	27. Protective equipment and device settings	The utility's procedures for adjusting the sensitivity of grid elements that can reduce wildfire risk. For example, this includes the utility's approach to adjusting reclosers by limiting or disabling reclosers in high fire threat districts. Higher scores are assigned to utilities with more automated processes.
	28. Incorporating ignition risk factors in grid control	The utility's process for determining when to operate electric lines and equipment above rated nameplate capacity. Higher scores are assigned to utilities that have clearly defined and explained protocols for operating equipment above nameplate capacity and incorporate understanding of incremental wildfire risk associated with operating conditions.
	29. PSPS operating model and consequence mitigation	The utility's ability to implement PSPS events including accurate predictions, customer communication, and mitigation activities. Higher scores are assigned to utilities that better predict, mitigate, and communicate about the consequences of PSPS.
	30. Protocols for PSPS initiation	The utility's approach to determining the thresholds for activating PSPS events. Higher scores are assigned to utilities that have well-defined PSPS protocols supported by risk-assessing algorithms, and that consider PSPS as a mitigation tool of last resort. PSPS initiation should also take into account the cost associated

Category	Capability	Capability description
		with de-energizing, including impacts on communities and critical facilities.
	31. Protocols for PSPS re-energization	The utility's approach to inspecting circuits after they have been de-energized and prior to a re-energization. Higher scores are assigned to utilities that have faster inspection processes and use technologies to complete these inspections cost-effectively.
	32. Ignition prevention and suppression	The utility personnel's ability to prevent and suppress ignitions caused by its activities. Higher scores are assigned to utilities that provide personnel with more robust training, tools, and explicit policies about what activities that they should be undertaking.
G. Data governance	33. Data collection and curation	The ability of the utility to track and retrieve a variety of situational, operational, and risk data to drive decisions. Higher scores are assigned to utilities that have the capabilities needed to handle large amounts of data, conduct sophisticated analytics, and share real time data.
	34. Data transparency and analytics	The utility's organization and openness toward sharing data listed in a centralized catalogue. Higher scores are assigned to utilities with a comprehensive catalogue of data, analyses, and algorithms and that can share data across multiple permissions levels.
	35. Risk event tracking	The utility's approach to tracking events with the potential to result in ignition. Higher scores are assigned to utilities that track risk events and accurately estimate their potential to cause ignition.
	36. Data sharing with research community	The utility's level of involvement in and support provided to the research community. Higher scores are provided for utilities that participate in research that addresses utility-related wildfire.
H. Resource allocation methodology	37. Scenario analysis across different risk levels	The ability of the utility to understand and explain the incremental risk reduction potential that incremental funding would enable. Higher scores are assigned to utilities that are able to

Category	Capability	Capability description
		show the incremental risk reduction potential at a more granular level.
	38. Presentation of relative risk spend efficiency for portfolio of initiatives	The utility's ability to estimate the degree of wildfire risk reduction achieved by specific wildfire risk management initiatives and weigh these reductions against the cost of those initiatives across the utility's grid. Higher scores are assigned to utilities with greater granularity by location and a higher frequency of updates to these estimates.
	39. Process for determining risk spend efficiency of vegetation management initiatives	The utility's ability to estimate the degree of wildfire risk reduction achieved by specific vegetation management initiatives and weigh these reductions against the cost of those initiatives, across the utility's grid. Higher scores are assigned to utilities with greater granularity by location and a higher frequency of updates to these estimates.
	40. Process for determining risk spend efficiency of system hardening initiatives	The utility's ability to estimate the degree of wildfire risk reduction achieved by specific system hardening initiatives and weigh these reductions against the cost of those initiatives across the utility's grid. Higher scores are assigned to utilities with greater granularity by location and a higher frequency of updates to these estimates.
	41. Portfolio-wide initiative allocation methodology	The utility's ability to efficiently and effectively decide which initiatives should be applied and to which part of its grid. Higher scores are assigned to utilities with greater granularity and that use risk-spend efficiency calculations.
	42. Portfolio-wide innovation in new wildfire initiatives	The program in place by the utility to evaluate and develop new initiatives across the entire portfolio, including inspection, grid operations, simulation, etc. Higher scores are assigned to utilities that have more robust processes for evaluating new technologies and evaluating the risk-spend efficiency of these technologies.

Category	Capability	Capability description
I. Emergency planning and preparedness	43. Wildfire plan integrated with overall disaster / emergency plan	The extent of coordination and synchronization between the utility's wildfire mitigation plan and emergency operations plans of the State and local jurisdictions. Higher scores are assigned to additional stakeholder engagement and for the use of simulations to stress-test plans.
	44. Plan to restore service after wildfire related outage	The extent and sophistication of utility's plans to restore electric service after a wildfire-related outage. Higher scores are assigned to utilities customizing plans at a greater granularity.
	45. Emergency community engagement during and immediately after wildfire	The utility's ability to clearly and effectively communicate information to affected communities. Higher scores are assigned to utilities with greater ability to reach vulnerable populations, using of multiple channels, and providing more relevant and useful information.
	46. Protocols in place to learn from wildfire events	The processes used by a utility to undertake after-action reviews following wildfire events. Higher scores are assigned to utilities with more extensive documentation and the extent to which the lessons learned are used to update capital and operational plans.
	47. Processes for continuous improvement after wildfire and PSPS events	The utility's application of continuous improvement processes, and incorporation of performance benchmarks and stakeholder feedback, to update capital and operational plans. Higher scores are assigned to utilities with more formalized review procedures, more extensive benchmarking, and more sophisticated stakeholder engagement.
J. Stakeholder cooperation and community engagement	48. Cooperation and best practice sharing with other utilities	The extent and sophistication of the utility's incorporation of lessons learned by peers, including those outside the State. Higher scores are assigned to utilities with more formal learning processes.
	49. Engagement with communities on utility wildfire mitigation initiatives	The extent and sophistication of the utility's engagement with the communities that it serves (and in which its assets are located), including key stakeholder groups. Higher scores are assigned to utilities with more successful

Category	Capability	Capability description
		engagement of landowners and other potential partners.
	50. Engagement AFN populations	The extent of the utility's relationship with stakeholders representing Access and Functional Needs (AFN) populations, and the utility's ability to reach these populations, both proactively and during emergencies. Higher scores are assigned to utilities with the ability to benefit from these relationships and in so doing minimize the consequence of PSPS and other wildfire mitigation measures on these populations.
	51. Collaboration with emergency response agencies	The extent and sophistication of the utility's engagement with suppression and other emergency planning agencies and stakeholder groups involved in wildfire response. Higher scores are assigned to utilities with broader engagement and deeper planning processes.
	52. Collaboration on wildfire mitigation planning with stakeholders	The extent and sophistication of the utility's engagement with non-emergency planning agencies and stakeholder groups involved in wildfire risk reduction initiatives. Higher scores assigned to utilities with broader engagement, a more comprehensive planning process (e.g., including environmental values as well as wildfire risk), and greater financial involvement in plan implementation.

The utility's maturity is then graded across five scoring categories ranging from a score of 0 at the low end to a score of 4 at the high end. Scores are generally awarded according to the following philosophy:

0. Below expectations
1. Meets minimum expectations
2. Beyond minimum expectations but not consistent with best practice
3. Consistent with best practice
4. Improvement over best practice

Additional descriptions that may represent typical scores are provided in the table below.

Table 2: Illustrative descriptions that may represent typical maturity levels

		Maturity				
		0	**1**	**2**	**3**	**4**
	Scoring philosophy	**Below minimum expectations** or expected standards (e.g., GO-95, FERC)	**Meets minimum expectations** or expected standards (e.g., GO-95, FERC)	**Beyond minimum expectations** but not consistent with best practices	**Consistent with best practice**	**Improvement over best practice**
	Typical characteristics	• Fails to establish consistent procedures or policies that meet minimum expectations	• Basic collaboration with other agencies	• Utility coordinates closely with other agencies	• Utility leads efforts with other agencies in all areas where appropriate	• Utility leads efforts with other agencies and develops new protocols to reduce wildfire and PSPS risk
	Typical data validation and granularity	• Sporadic or inconsistent data validation • Generally, little granularity across grid	• Ad-hoc data validation by experts • Regional granularity across grid	• Systematic data validation using historical measurements and expert input • Circuit-level granularity	• Systematic validation using historical measurements and expert input • Span-level granularity	• Systematic validation using historical measurements and expert input • Real-time machine learning • Asset-level granularity

	Level of systematization and automation	• Little systematization • No automation	• Basic systems in place for workflow management • Some automated processes to support decision makers	• Detailed and tested workflow systems • Semi-automated processes exist to support decision makers in key decisions	• Detailed and tested workflow systems • Automated and vetted processes exist for to support decision makers in nearly all circumstances	• Detailed and tested workflow systems • Automated processes competently handle most decisions and actions without manual intervention
	Typical approach to learning and updates	• Insufficient structures to incorporate learnings in updated processes	• Basic systems and methods in place to manually incorporate learnings into new processes • Subject matter experts review decision-making and manually incorporate learnings into new decision-making	• Detailed systems and methods in place to manually incorporate learnings into processes • Subject matter experts review decision-making and incorporate learnings into future decisions using defined processes	• Well-defined systems and methods in place to frequently incorporate most learnings into processes • Subject matter experts review decision-making and incorporate learnings into automated processes to support decision makers	• Tested systems and methods to automatically and continuously update processes and tools in real time • Subject matter experts review decision-making and incorporate learnings into fully automated decision-making processes and algorithms

Category A: Risk assessment and mapping

Illustrative descriptions that may represent typical grades—not comprehensive

	Maturity level				
Capability	**0**	**1**	**2**	**3**	**4**
1. Climate scenario modeling	No clear ability to understand incremental risk under various weather scenarios	Ability to reliably determine wildfire risk i) across each region of the grid ii) based on weather and estimates of how the weather affects failure modes and fire propagation	i) Partially automated tools and process to reliably categorize weather scenarios by level of risk ii) across each circuit of the grid, iii) based on existing hardware, and weather and estimates of how the weather affects failure modes and fire propagation, and iv) independently assessed by experts	i) Mostly automated tools and process to reliably estimate risk of various weather scenarios ii) for each span of the grid, iii) based on level of vegetation, weather as measured at circuit level, existing hardware, and estimates of how the weather affects failure modes and fire propagation, and iv) independently assessed by experts and supported by historical data of incidents and risk events	i) Fully automated tools and processes to accurately and quantitatively estimate incremental risk of foreseeable weather scenarios ii) for each asset of the grid, iii) based on level of vegetation, weather measured at the circuit level, and existing hardware, and estimates of how the weather affects failure modes and fire propagation, iv) independently assessed by experts and verified by historical evidence of risk events and incidents, and v) updated based on real-time learning during weather event

	Maturity level				
Capability	**0**	**1**	**2**	**3**	**4**
2. Ignition risk estimation	No reliable tool or process to estimate risk across sections of the grid based on characteristics and condition of lines and equipment and vegetation	i) Partially automated tools and processes to reliably categorize regions of the grid as ii) high or low risk based on iii) at least characteristics and condition of lines and equipment and surrounding vegetation, with iv) subjective assessment of areas by experts	i) Mostly automated tools and processes to reliably categorize ii) individual circuits into iii) high or low risk based on iv) at least characteristics and condition of lines and equipment, surrounding vegetation, and area weather patterns, with v) assessment risk confirmed based on historical data	i) Fully automated tools and processes to ii) quantitatively and accurately assess the risk of ignition at iii) span level across entire grid based on characteristics including surrounding vegetation, weather patterns at individual span, and other factors, with iv) assessment risk confirmed based on historical data	i) Fully automated tools and processes to ii) accurately and quantitatively assess the risk of ignition iii) across entire grid iv) at asset level resolution within individual circuits, v) based on characteristics including surrounding vegetation, weather patterns at individual circuit, flying debris probability, and other factors, vi) with probability estimated based on understanding of specific failure modes and top contributors to those failure modes with vii) assessment risk confirmed based on historical data
3. Estimation of wildfire consequences on communities	No translation of ignition risk estimates to potential consequences for communities	i) Partially automated tools to reliably categorize ignition events as high or low risk to communities ii) as a function of at least one of structures burned, potential fatalities, area burned, or damages for each	i) Mostly automated tools to reliably categorize ignition events in 5 or more levels of risk to communities ii) as a function of at least potential fatalities, and one of structures burned or area burned	i) Fully automated tools and processes to accurately and quantitatively estimate consequence ii) as a function of at least potential fatalities and structures burned or area burned or damages, iii) the	i) Fully automated tools and processes to ii) accurately and quantitatively estimate consequence from ignition iii) as a function of at least potential fatalities, structures burned or monetary damages, area burned,

	Maturity level				
Capability	**0**	**1**	**2**	**3**	**4**
		region of the grid, iii) independently assessed by experts	or damages, for each circuit of the grid, iii) based on level and conditions of vegetation and weather, and iv) independently assessed by experts	damage to communities for ignition events at each individual span across the grid iv) across all seasons of the year, v) based on vegetation species and weather, vi) independently assessed by experts & confirmed by historical data	and impact on GHG reduction goals, across entire grid iv) at asset level resolution within individual circuits, v) based on characteristics including surrounding vegetation species and up-to-date moisture content, weather patterns at individual circuit, across all seasons, vi) independently assessed by experts & confirmed updated based on real time learning
4. Estimation of wildfire and PSPS risk-reduction impact of initiatives	No clear estimation of risk reduction potential across most initiatives	Mostly manual approach to i) accurately estimate risk reduction potential of initiatives averaged across the territory where such initiatives could be installed for each region, ii) with evidence and logical reasoning to support estimates	i) Automated tools and process to support subject matter experts in ii) accurately categorizing initiatives by risk reduction potential iii) for each circuit of the grid, iv) based on existing hardware, and v) independently assessed by third-party experts	i) Mostly automated tools and process to ii) reliably and accurately estimate risk reduction potential of initiatives iii) for each span of the grid, iv) based on level and condition of vegetation, weather, and existing hardware type and condition including operating history, and v) independently assessed by third-party experts	i) Fully automated tools and processes to ii) accurately and quantitatively estimate risk reduction potential of initiatives iii) for each asset on the grid, iv) based on level and condition of vegetation, weather, and existing hardware, v) and considering the combination of initiatives already deployed, and vi) independently assessed

	Maturity level				
Capability	**0**	**1**	**2**	**3**	**4**
					by experts and verified by historical evidence
5. Risk maps and simulation algorithms	No defined process for updating risk mapping algorithms	Risk mapping algorithms i) updated at least bi-annually based on ii) manually detected differences between modeled ignitions and actual ignitions and wildfire propagation	i) Partially automated tools and process to reliably determine whether risk map and simulations should be updated ii) based on semi-automated detection of differences between modeled ignitions and iii) actual ignition and propagation data, and iv) independently assessed by experts	i) Mostly automated tools and process to reliably determine whether risk map and simulations should be updated ii) based on semi-automated detection of differences between modeled risk events (including ignitions) and iii) risk event and actual ignition and propagation data, and iv) independently assessed by experts and historical data	i) Fully automated tools and process to accurately and quantitatively update risk map and simulations substantially continuously in real-time ii) based on automated detection of differences between modeled risk events (including ignitions) and measured data using iii) both risk event and actual ignition and propagation data, iv) including data derived from other utilities or other sources, and v) independently assessed by experts and historical data

Category B: Situational awareness and forecasting

Illustrative descriptions that may represent typical grades—not comprehensive

	Maturity level				
Capability	**0**	**1**	**2**	**3**	**4**
6. Weather variables collected	Weather data being collected insufficient to properly understand risks along grid	Wind, temperature, and relative humidity being accurately measured along grid	i) Range of accurate weather variables collected including at least wind, temperature, and relative humidity, that ii) affect risk of ignition and propagation from utility assets; iii) manual field calibration measurements taken to validate measurement hardware	i) Range of accurate weather variables collected including at least wind, temperature, and relative humidity, that ii) impact risk of ignition from utility assets and propagation; iii) manual field calibration measurements taken to validate measurement hardware; iv) accurate predictions made of the status of elements that cannot reliably be measured in real time (e.g., fuel moisture content); v) further data collected to measure physical impact of weather on grid (e.g., sway in lines, sway in vegetation, etc.)	i) Range of accurate weather variables collected, including at least wind, temperature, and relative humidity, that ii) impact risk of ignition from utility assets and propagation; iii) automatic field calibration measurements taken to validate measurement hardware; iv) accurate predictions made of the status of elements that cannot reliably be measured in real time (e.g., fuel moisture content), v) further data collected to measure physical impact of weather on grid (e.g., sway in lines, sway in vegetation, etc.), vi) with each collected from multiple sources

	Maturity level				
Capability	**0**	**1**	**2**	**3**	**4**
7. Weather data resolution	Weather data collected does not accurately reflect local weather conditions across grid infrastructure	Gather weather data with i) sufficient granularity to reliably measure weather conditions ii) independently for each area of the grid iii) at least on an hourly basis	Gather weather data with i) sufficient granularity to reliably measure weather conditions using a partially automated process ii) independently for each circuit mile of the grid iii) at least 4 times per hour	Gather weather data with i) sufficient granularity to reliably measure weather conditions using a mostly automated process ii) independently and sufficient to reliably estimate conditions at each span of the grid iii) at least 6 times per hour; iv) along the entire grid and in all areas needed to predict weather on the grid	Gather weather data with i) sufficient granularity to reliably measure weather conditions using a completely automated process ii) independently and sufficient to estimate conditions around each span and each asset that may cause wildfire iii) at least 60 times per hour; iv) along the entire grid and in all areas needed to predict weather on the grid; v) including wind estimations at various atmospheric altitudes relevant to risk of wildfire ignition and consequence
8. Weather forecasting ability	No reliable independent weather forecasting ability	Weather forecasting ability sufficiently accurate to fulfill PSPS requirements at circuit level	Utility i) uses a combination of accurate weather stations and ii) external weather data to make partially automated and accurate forecasts iii) at least 1 week in advance iv) at circuit level; v) which are	Utility i) uses a combination of accurate weather stations and ii) external weather data to make mostly automated and accurate forecasts iii) at least 1 week in advance iv) at individual span level;	Utility i) uses a combination of accurate weather stations and ii) external weather data to make mostly automated and accurate forecasts iii) at least 2 weeks in advance iv) at individual span level

	Maturity level				
Capability	**0**	**1**	**2**	**3**	**4**
			error-checked against historical weather patterns	v) which are error-checked against historical weather patterns and subject matter expert input	and around each asset with potential to cause ignition; v) which are error checked against historical weather patterns and subject matter expert input; and vi) adjusted in real-time based on a learning algorithm and updated weather inputs
9. External sources used in weather forecasting	Utility does not use external weather data	Utility i) uses external data ii) where direct measurements from the utility's own weather stations are not available	Utility i) uses a combination of accurate weather stations and ii) external weather data to make decisions, and iii) has reliable, defined, and mostly manual processes for error checking weather stations with external data sources	Utility i) uses a combination of accurate weather stations and ii) external weather data to iii) automatically produce a combined weather map, and iv) has reliable, defined, and mostly automated processes for combining and error checking weather stations with external data sources, v) and electing to use the data set that, as a whole or in composite is most accurate	Utility i) uses a combination of accurate weather stations and ii) external weather data to iii) automatically produce a combined weather map, and iv) has reliable, defined, and completely automated processes for combining and error checking weather stations with external data sources into a single visual and configurable live map, v) and where the utility builds new weather stations or verifies the accuracy of existing stations and calibrates

	Maturity level				
Capability	**0**	**1**	**2**	**3**	**4**
					stations where possible based on these error checking processes
10. Wildfire detection processes and capabilities	No reliable equipment or procedures for detecting ignitions along grid	i) Well-defined procedures and equipment for detecting ignitions along grid, including ii) remote detection equipment, including cameras	i) Well-defined procedures and equipment for detecting ignitions along grid, including ii) remote detection equipment, including cameras iii) augmented by ignition detection algorithms or software, and iv) including a procedure for notifying suppression forces	i) Well-defined procedures and equipment for detecting ignitions along grid, including ii) remote detection equipment, including cameras that are iii) augmented with automated ignition detection algorithms or software, in which iv) satellite monitoring of utility territory to detect utility ignitions automatically, in which v) detection is reported to key stakeholders including suppression forces vi) automatically, accurately, and in real time	i) Well-defined procedures and equipment for detecting ignitions along grid, including ii) remote detection equipment, including cameras that are iii) fully operated using automated ignition detection algorithms or software, and iv) satellite monitoring of utility territory to detect utility ignitions automatically, in which v) detection is reported to key stakeholders including suppression forces automatically, and vi) propagation paths are tracked and reported to suppression forces accurately and in real time

Category C: Grid design and system hardening

Illustrative descriptions that may represent typical grades—not comprehensive

	Maturity level				
Capability	**0**	**1**	**2**	**3**	**4**
11. Approach to prioritizing initiatives across territory	Plan does not clearly prioritize initiatives geographically to focus on highest risk areas	Plan prioritizes wildfire and PSPS risk reduction initiatives to within only HFTD areas	Plan prioritizes wildfire and PSPS risk reduction initiatives at the circuit level based on local geography and climate/weather conditions within HFTD areas	Plan prioritizes wildfire and PSPS risk reduction initiatives at the span level based on i) risk modeling driven by local geography and climate/weather conditions, fuel loads and moisture content and topography ii) detailed wildfire and PSPS risk simulations across individual circuits,	Plan prioritizes wildfire and PSPS risk reduction initiatives at the asset level based on i) risk modeling driven by local geography and climate/weather conditions, fuel loads and moisture content and topography ii) risk estimates across individual circuits, including estimates of actual consequence, and iii) taking power delivery uptime into account (e.g. reliability, PSPS, etc.)
12. Grid design for minimizing ignition risk	Grid topology does not meet minimal design standards in areas with high wildfire risk	Grid topology meets minimal design standards in areas with high wildfire risk, and routing of new portions of grid takes wildfire risk into account	Grid topology i) demonstrates an understanding of the drivers of utility ignition risk, and ii) is designed in a way to substantially address it, exceeding design requirements, with routing of new portions of grid taking	Grid topology designed in a manner that incorporates the latest principles of asset management, utilizes new technologies, and reflects an aggressive commitment to minimizing utility ignition by providing the utility control over	Grid topology sets planned using wildfire risk as a key driver for minimizing ignition risk through its use of innovative technologies and asset management strategies, and routing of new portions of grid takes wildfire risk into account, including by

	Maturity level				
Capability	**0**	**1**	**2**	**3**	**4**
			wildfire risk into account	its assets during periods of high fire risk, with routing of new portions of grid taking wildfire risk into account	providing microgrids or islanding in situations where traditional grid infrastructure is impracticable and at high wildfire risk
13. Grid design for resiliency and minimizing PSPS	Grid design and architecture has many single points of failure	Grid architecture i) includes n-1 redundancy for transmission circuits subject to PSPS ii) and switches in HFTD areas to individually isolate circuits	Grid architecture i) includes n-1 redundancy for transmission circuits subject to PSPS and n-1 redundancy for distribution subject to PSPS covering at least 50% of customers in HFTD ii) and switches in HFTD areas to isolate individual circuits such that no more than 2000 customers sit within one switch iii) with egress points used as an input for grid topology design	Grid architecture i) includes n-1 redundancy for transmission circuits subject to PSPS and n-1 redundancy for distribution subject to PSPS covering at least 70% of customers in HFTD ii) and switches in HFTD areas to isolate individual circuits such that no more than 1000 customers sit within one switch iii) with egress points available and mapped for each customer, with potential traffic mapped based on traffic simulation and taken into consideration for grid topology design	Grid architecture i) includes n-1 redundancy for transmission circuits subject to PSPS and n-1 redundancy for distribution subject to PSPS covering at least 85% of customers in HFTD ii) and switches in HFTD areas to isolate individual circuits such that no more than 200 customers sit on one switch iii) with egress points available and mapped for each customer, with potential traffic simulated and taken into consideration for grid topology design, and iv) microgrids or other means to reduce consequence for customers at frequent risk of PSPS

	Maturity level				
Capability	**0**	**1**	**2**	**3**	**4**
14. Risk-based grid hardening and cost efficiency	Utility has no clear understanding of the relative risk-spend efficiency of hardening initiatives	Utility has i) accurate relative understanding of the ii) cost, and iii) feasibility of producing a iv) reliable risk-spend efficiency estimate of v) commonly deployed and commercially available grid hardening initiatives vi) in each area of the utility's grid	Utility has i) accurate relative understanding of the ii) cost, and iii) feasibility of producing a iv) reliable risk-spend efficiency estimate of v) commonly deployed and commercially available grid hardening initiatives vi) for each circuit of the utility's grid vii) updated on an annual basis	Utility has i) accurate quantitative understanding of the ii) cost, including sensitivities, and iii) feasibility of producing a iv) reliable risk-spend efficiency estimate of v) all commercially available grid hardening initiatives vi) for each span along the utility's grid vii) updated on an annual basis	Utility has i) accurate quantitative understanding of the ii) cost, including sensitivities, and iii) feasibility of producing a iv) reliable risk-spend efficiency estimate of v) all commercially available grid hardening initiatives, vi) and those initiatives that are lab-tested, vii) for each asset along the utility's grid viii) updated on an annual basis, ix) including risk reduction effect from the combination of various initiatives to reduce risk to communities
15. Grid design and asset innovation	No established program for evaluating the wildfire risk, PSPS risk and risk-spend efficiency of new hardening initiatives	New initiatives developed and evaluated based on i) installation of hardening initiatives into grid and ii) measuring direct reduction in ignition events	New initiatives developed and evaluated based on i) installation of hardening initiatives into grid and ii) measuring direct reduction in ignition events and iii) measuring reduction impact on risk event	New initiatives i) developed and independently evaluated using lab facilities by a trained team of grid innovation specialists, followed by ii) field testing based on installation into grid and iii) measuring direct reduction in	New initiatives i) developed and independently evaluated using lab facilities by a trained team of grid innovation specialists, ii) field testing done by installation into grid and iii) measuring direct reduction in

	Maturity level				
Capability	**0**	**1**	**2**	**3**	**4**
			metrics; iv) including an evaluation of the total cost of the initiative	ignition events at a span level and iv) measuring reduction impact on risk event metrics; v) including an evaluation of the total cost of the initiative	ignition events and iv) measuring reduction impact on risk event metrics v) independent auditing of performance in grid; vi) extensive data sharing with industry, academia, and other utilities utilizing the same initiatives to share results; vii) including an evaluation of the total cost of initiative

Category D: Asset management and inspections

Illustrative descriptions that may represent typical grades—not comprehensive

	Maturity level				
Capability	**0**	**1**	**2**	**3**	**4**
16. Asset inventory and condition assessments	Lack of inventory of all electric lines and equipment and their state of wear or disrepair across the service territory	Accurate i) inventory database that is updated within 90 days of equipment inventory or conditions being collected of ii) equipment that may contribute to wildfire and PSPS risk, iii) including age, state of wear, and expected lifecycle	Accurate i) inventory database that is updated within 30 days of equipment inventory or conditions being collected of ii) equipment that may contribute to wildfire and PSPS risk, iii) including age, state of wear, and expected lifecycle, iv) and records of all inspections and repairs conducted	Accurate i) at least monthly updated inventory database that is updated within 7 days of equipment inventory or conditions being collected of ii) all components that may contribute to wildfire and PSPS risk, iii) including age, state of wear, operating history, expected lifecycle, and probability of failure, iv) and records of all inspections and repairs conducted, v) up to date work plans on expected future repairs and replacements, vi) wherein repairs are independently audited, vii) and a system and approach are in place to reliably detect incipient malfunctions likely to cause ignition	Accurate and i) substantially real-time inventory database that is updated within 1 day of equipment inventory or conditions being collected of ii) all components that may contribute to wildfire and PSPS risk, iii) including age, state of wear, operating history, expected lifecycle, and probability of failure, iv) and records of all inspections and repairs conducted, v) inputs from sensorized equipment that substantially continuously monitors the state of electric lines and equipment, vi) up to date work plans on expected future repairs and replacements, vii) wherein repairs and

	Maturity level				
Capability	**0**	**1**	**2**	**3**	**4**
					sensor outputs are independently audited, viii) and a system and approach are in place to reliably detect incipient malfunctions likely to cause ignition, including in real time and with the ability to de-activate electric lines and equipment exhibiting incipient failure
17. Asset inspection cycle	Inspections less frequent than minimum expectations	Detailed inspection and patrol inspection frequency consistent with minimum expectations	Detailed inspections and patrol inspections of electric lines and equipment scheduled based on: i) an up-to-date static map of equipment type and environment, ii) with more frequent inspections for highest risk equipment in areas with fire potential, and all equipment in HFTD areas	Detailed inspections and patrol inspections i) scheduled based on risk, and ii) demonstrated to be determined by accurate predictive modeling of equipment failure probability and risk of failure causing ignition; iii) where failure probability is assessed via analysis of early indicators and actual failures; additional inspection types (i.e., beyond routine patrols and detailed) implemented as needed	Detailed inspections and patrol inspections i) scheduled based on risk, with ii) each inspection type (e.g., ground-based, aerial, subsurface, etc.) iii) demonstrated to be determined independently by accurate predictive modeling of equipment failure probability and risk of failure causing ignition, iv) where failure probability is assessed via analysis of early indicators and actual failures, and v) continuous monitoring

	Maturity level				
Capability	**0**	**1**	**2**	**3**	**4**
					by sensors to monitor the condition of electric lines and equipment areas with fire risk
18. Asset inspection effectiveness	Patrol, detailed, enhanced, and other inspection procedures and checklists do not include all items expected at a minimum	Patrol, detailed, enhanced, and other inspection procedures and checklists include all items expected at a minimum	Procedures and checklists for patrol, detailed, enhanced, and other inspections each determined according to: i) wildfire risk estimated via accurate predictive modeling, ii) for each circuit of the service territory, iii) based on equipment type and age, iv) which includes inspections for electric lines and equipment responsible for wildfire ignitions and risk events	Procedures and checklists for patrol, detailed, enhanced, and other inspections i) determined according to wildfire risk estimated via accurate predictive modeling ii) for each span iii) based on equipment type, age, and condition iv) which includes inspections for electric lines and equipment responsible for wildfire ignitions and risk events, v) validated by independent experts, and vi) providing basic training and conducting spot inspections to identify vegetation-based risk drivers	Inspection procedures and checklists for patrol, detailed, enhanced, and other inspections determined i) according to wildfire risk estimated via accurate predictive modeling, and ii) adjusted dynamically and in real time based on number and severity of deficiencies found during inspection iii) for each asset iv) based on equipment type, age, condition, and operating history v) which includes inspections for electric lines and equipment responsible for wildfire ignitions and risk events, and vi) based on predictive modeling based on equipment type, age, and condition and validated by independent

	Maturity level				
Capability	**0**	**1**	**2**	**3**	**4**
					experts, with dynamic adjustments in real time based on deficiencies found during inspection, and vi) asset inspection personnel being trained to conduct vegetation patrol inspections to identify vegetation-based risk drivers, including logging relevant risk drivers and in a vegetation management system
19. Asset maintenance and repair	Electric lines and equipment not consistently maintained at expected condition over multiple circuits	Electric lines and equipment maintained as expected under applicable rules	Electric lines and equipment maintained as expected, and additional maintenance done in circuits at highest wildfire risk based on detailed risk mapping	Electric lines and equipment maintained as expected under applicable rules, and additional maintenance done in spans at highest wildfire risk based on detailed risk mapping, with service intervals of equipment being set based on wildfire risk in the relevant area, with maintenance and repair procedures taking into account wildfire risk	Electric lines and equipment maintained as expected under applicable rules, and additional maintenance done on assets at highest wildfire risk based on detailed risk mapping, with service intervals of equipment being set based on wildfire risk in the relevant circuit, as well as real-time monitoring from sensors, with maintenance and repair procedures taking into account wildfire risk,

	Maturity level				
Capability	**0**	**1**	**2**	**3**	**4**
					performance history and past operating conditions
20. QA/QC for asset management	Lack of any one of i) established controls for ii) maintenance or inspection work, iii) post construction inspections of employee and contractor work, iv) follow-up and correction process and documentation, and v) auditing work completed including deep-dive spot inspections, whether conducted by employees or sub-contractors	Established and demonstrably functioning i) maintenance and inspection work, ii) post construction inspections of employee and contractor work, iii) follow-up and correction process and documentation, and audit process to manage and confirm work completed by employees or subcontractors, and iv) QA/QC information is used periodically to identify deficiencies in quality of work and inspections	Established and demonstrably functioning i) maintenance and inspection work, ii) post construction inspections of employee and contractor work, iii) follow-up and correction process and documentation, and audit process to manage and confirm work completed by subcontractors, iv) where subcontractors follow same processes and standards as utility's own employees, and v) QA/QC information is regularly used to identify systematic deficiencies in quality of work and inspections	Established and demonstrably functioning i) maintenance and inspection work, ii) post construction inspections of employee and contractor work, iii) follow-up and correction process and documentation, and audit process to manage and confirm work completed by subcontractors, and where subcontractors follow same processes and standards as utility's own employees iv) where contractor activity is subject to semi-automated audits (e.g., using photographic evidence, LiDAR scans, etc.), and v) a defined procedure is in place to use QA/QC information to identify systematic deficiencies in quality of work and inspections, and recommend training based on weaknesses	Established and demonstrably functioning i) maintenance and inspection work, ii) post construction inspections of employee and contractor work, iii) follow-up and correction process and documentation, and audit process to manage and confirm work completed by employees and subcontractors, iv) where subcontractors follow same processes and standards as utility's own employees, v) use integrated workforce management processes and tools vi) where contractor activity is subject to automated audits (e.g., using photographic evidence, LiDAR scans, etc.), and vii) real-time QA/QC information is used to identify systematic deficiencies, grade individuals, and recommend specific pre-made and tested

	Maturity level				
Capability	**0**	**1**	**2**	**3**	**4**
					training based on weaknesses

Category E: Vegetation management and inspections

Illustrative descriptions that may represent typical grades—not comprehensive

			Maturity level		
Capability	**0**	**1**	**2**	**3**	**4**
21. Vegetation inventory and condition assessments	Lack of vegetation inventory sufficient to determine vegetation clearances across grid at time of last inspection	i) Centralized and accurate ii) inventory database of vegetation clearances that is updated within 90 days of vegetation inventory or conditions being collected ii) across each region based on most recent inspection	i) Centralized and accurate inventory database of vegetation clearances that is updated within 30 days of vegetation inventory or conditions being collected ii) across each circuit based on most recent inspection, including iii) inventory of predominant vegetation species at each circuit, and iv) individual high-risk trees (e.g., those within striking distance) across grid	i) Centralized and accurate inventory of vegetation clearances that is updated within 7 days of vegetation inventory or conditions being collected ii) across each span based on most recent inspection, iii) inventory of individual vegetation species around each span, and iv) including expected growth rates and v) individual high-risk trees (e.g., those within striking distance) across grid vi) wherein inspections are independently audited, vii) and including capturing tree health and other vegetation risk factors	i) Accurate centralized inventory database of ii) real-time vegetation clearances that is updated within 1 day of vegetation inventory or conditions being collected ii) across each asset based on most recent inspection, with iii) inventory of vegetation types and species around each asset, iv) individual high-risk trees (e.g., those with strike potential) across entire grid, and v) up-to-date tree health and moisture content at the time of last inspection to determine risk of ignition and propagation; vi) wherein inspections are independently audited vi) and including capturing tree health and other vegetation risk factors

			Maturity level		
Capability	**0**	**1**	**2**	**3**	**4**
22. Vegetation inspection cycle	Inspections less frequent than expected under applicable rules	All inspection frequency consistent with minimum expectations	All inspections scheduled based on i) a static vegetation map of predominant vegetation species and environments across the utility territory, with ii) more frequent inspections for areas with fastest growing vegetation based on typical growth rates	All inspections i) scheduled based on risk, ii) demonstrated to be determined by predictive modeling of vegetation growth iii) assessed via vegetation species and iv) growing conditions (e.g., precipitation, temperature, etc.), v) and considering tree health and other vegetation risk factors for more frequent inspections in less healthy areas	All inspections i) scheduled based on risk, with ii) each inspection type (e.g., ground-based, aerial, subsurface, etc.) iii) demonstrated to be determined independently by predictive modeling of vegetation growth iv) assessed via vegetation species, growing conditions (e.g., precipitation, temperature, etc.), and failure characteristics, v) continuous sampling of sensor data, vi) and considering tree health and other vegetation risk factors for more frequent inspections in less healthy areas

23. Vegetation inspection effectiveness	Patrol, detailed, enhanced, and other inspection procedures and checklists do not include all items expected under applicable rules	Patrol, detailed, enhanced, and other inspection procedures and checklists include all items expected under applicable rules	Procedures and checklists for patrol, detailed, enhanced, and other inspections each determined according to: i) wildfire risk estimated via accurate predictive modeling, ii) for each circuit of the service territory, iii) based on vegetation density and equipment type and age, iv) which includes inspections for electric lines and equipment responsible for wildfire ignitions and risk events	Procedures and checklists for patrol, detailed, enhanced, and other inspections i) determined according to wildfire risk estimated via accurate predictive modeling ii) for each span iii) based on vegetation and equipment type, age, and condition iv) which includes inspections for electric lines and equipment responsible for wildfire ignitions and risk events, and v) validated by independent experts; vi) vegetation inspection personnel being trained to conduct simple equipment patrol inspections and logging faults into the utility's asset management tool	Inspection procedures and checklists for patrol, detailed, enhanced, and other inspections determined i) according to wildfire risk estimated via accurate predictive modeling, and ii) adjusted dynamically and in real time based on number and severity of deficiencies found during inspection iii) for each asset iv) based on vegetation species, condition, environment and equipment type, age, condition, and operating history v) which includes inspections for electric lines and equipment responsible for wildfire ignitions and risk events, and vi) based on predictive modeling based on vegetation and equipment type, age, and condition and validated by independent experts, with dynamic adjustments in real time based on

			Maturity level		
Capability	**0**	**1**	**2**	**3**	**4**
					deficiencies found during inspection; vii) vegetation inspection personnel being trained to conduct equipment patrol inspections, particularly in areas of highest risk to identify and prioritize faults for the utility's asset management tool
24. Vegetation grow-in mitigation	Utility often fails to maintain minimum expected clearances around lines and equipment. Utility does not remove vegetation waste/residue along right of ways.	Utility maintains vegetation around lines and equipment according to minimum expected clearances. Utility i) removes vegetation waste/residue along right of ways ii) within 1 week of cutting vegetation across entire grid	Utility meets or exceeds minimum expected clearances during all seasons around electric lines and equipment in the HFTD at circuit level. Utility i) removes vegetation waste/residue along right of ways ii) within 3 days of cutting vegetation across entire grid, and iii) works with landowners to ensure wood removed from potential ignition areas	Utility meets or exceeds minimum expected clearances where relevant based on input from ignition risk modeling during all seasons around electric lines and equipment in the HFTD, with clearances also determined by species growth rates and species limb failure estimates at the span level and engages with communities on clearances protocols. Utility i) removes vegetation waste/residue along right of ways ii) on	Utility meets or exceeds minimum expected clearances, with clearances being determined based on species growth rates, species limb failure rates cross-referenced with local climatological conditions and an accurate ignition and propagation risk modeling and works with community organizations to cooperatively set local clearances and protocols. Utility i) removes vegetation waste/residue along right of ways on ii)

			Maturity level		
Capability	**0**	**1**	**2**	**3**	**4**
				same day as cutting vegetation	same day as cutting vegetation; iii) utility collaborates with local landowners to provide a use for cutting vegetation across entire grid; iv) utility works with partners to identify new cost-effective uses for vegetation waste/residue and v) takes into consideration environmental consequences and emissions of vegetation waste/residue
25. Vegetation fall-in mitigation	Utility does not remove vegetation outside of right of way. Utility does not remove vegetation waste/residue along right of ways.	Utility i) removes some vegetation outside of right of ways but ii) does not have a specific process in place to systematically identify trees likely to pose a risk Utility iii) removes vegetation waste/residue outside right of ways ii) within 1 week of cutting vegetation across entire grid	Utility i) systematically removes vegetation outside of right of ways ii) based on the height of trees with potential to make contact with electric lines and equipment and iii) informs communities about vegetation removal. Utility iv) removes vegetation waste/residue outside of right of ways v) within 3 days of cutting	Utility i) systematically removes vegetation outside of right of ways ii) based on the probability and consequence for electric lines and equipment iii) based on risk modeling and iv) engages with communities on vegetation removal. Utility v) removes vegetation waste/residue outside	Utility i) conducts regular and ii) accurate systematic inspections for individual trees outside the right of way to identify high risk trees and considers iii) environmental or climatological conditions contributing to increased risk and removes this vegetation, the with cooperation from community. Utility iv)

			Maturity level		
Capability	**0**	**1**	**2**	**3**	**4**
			vegetation across entire grid, and vi) works with landowners to ensure wood removed from potential ignition areas.	of right of ways vi) on same day as cutting vegetation	removes vegetation waste/residue along right of ways on ii) same day as cutting vegetation; v) utility collaborates with local landowners to provide a use for cutting vegetation across entire grid; vi) utility works with partners to identify new cost-effective uses for vegetation waste/residue and vi) takes into consideration environmental consequences and emissions of vegetation waste/residue
26. QA/QC for vegetation management	Lack of any one of i) established controls for ii) vegetation management or vegetation inspection work, iii) post vegetation management inspections of employee and contractor work, iv) follow-up and	Established and demonstrably functioning i) vegetation management and inspection work, ii) post vegetation management inspections of employee and contractor work, iii) follow-up and	Established and demonstrably functioning i) vegetation management and inspection work, ii) post vegetation management inspections of employee and contractor work, iii) follow-up and	Established and demonstrably functioning i) vegetation management and inspection work, ii) post vegetation management inspections of employee and contractor work, iii) follow-up and	Established and demonstrably functioning i) vegetation management and inspection work, ii) post vegetation management inspections of employee and contractor work, iii) follow-up and

			Maturity level		
Capability	**0**	**1**	**2**	**3**	**4**
	correction process and documentation, and v) auditing work completed including deep-dive spot inspections, whether conducted by employees or sub-contractors	correction process and documentation, and audit process to manage and confirm work completed by employees or subcontractors, and iv) QA/QC information is used periodically to identify deficiencies in quality of work and inspections	correction process and documentation, and audit process to manage and confirm work completed by subcontractors, iv) where subcontractors follow same processes and standards as utility's own employees, and v) QA/QC information is regularly used to identify systematic deficiencies in quality of work and inspections	correction process and documentation, and audit process to manage and confirm work completed by subcontractors, and where subcontractors follow same processes and standards as utility's own employees iv) where contractor activity is subject to semi-automated audits (e.g., using photographic evidence and analytics, , LiDAR scans, etc.), and v) a defined procedure is in place to use QA/QC information to identify systematic deficiencies in quality of work and inspections, and recommend training based on weaknesses	correction process and documentation, and audit process to manage and confirm work completed by employees and subcontractors, iv) where subcontractors follow same processes and standards as utility's own employees, v) use integrated workforce management processes and tools vi) where contractor activity is subject to automated audits (e.g., using photographic evidence and analytics, LiDAR scans, satellite and aerial imagery, etc.), and vii) real-time QA/QC information is used to identify systematic deficiencies, grade individuals, and recommend specific pre-made and tested training based on weaknesses

Category F: Grid operations and protocols

Illustrative descriptions that may represent typical grades—not comprehensive

	Maturity level				
Capability	**0**	**1**	**2**	**3**	**4**
27. Protective equipment and device settings	Utility does not make changes to adjustable equipment in response to high wildfire threat conditions	Utility i) increases sensitivity of risk reduction elements ii) during high threat weather conditions	Utility i) increases sensitivity of risk reduction elements ii) during high threat weather conditions and iii) monitors risk events in a iv) partially automated process to set sensitivity of grid elements	Utility i) increases sensitivity of risk reduction elements ii) during high threat weather conditions based on risk mapping and iii) monitors risk events in a iv) partially automated process to set sensitivity of grid elements and via v) mostly predetermined protocol driven by fire risk conditions	Utility i) automatically increases sensitivity of risk reduction elements ii) during high threat weather conditions based on risk mapping and iii) monitors risk events in a iv) fully automated process to set sensitivity of grid elements via v) predetermined protocol driven by fire risk conditions
28. Incorporating risk factors in grid control	Utility has no clearly defined and explained process for incorporating wildfire risk when determining electric control limits of the grid beyond equipment nameplate capacities (e.g., exceeding rated current or voltage design) or does not	Utility has i) clearly defined and explained process for incorporating wildfire risk when determining electric control limits of the grid beyond equipment nameplate capacities (e.g., exceeding rated current or voltage design) and ii) has	Utility has i) clearly defined and explained process for incorporating wildfire risk when determining electric control limits of the grid beyond equipment nameplate capacities (e.g., exceeding rated current or voltage	Utility has i) clearly defined and explained process for incorporating wildfire risk when determining electric control limits of the grid beyond equipment nameplate capacities (e.g., exceeding rated current or voltage design) and ii) has systems in place to automatically track	Utility has i) clearly defined and explained process for incorporating wildfire risk when determining electric control limits of the grid beyond equipment nameplate capacities (e.g., exceeding rated current or voltage design) and ii) has systems in place to

	Maturity level				
Capability	**0**	**1**	**2**	**3**	**4**
	track detailed electric operational history when operating equipment above nameplate capacities	systems in place to automatically track and record detailed electric operational history when operating equipment above nameplate capacities at the circuit level.	design) and ii) has systems in place to automatically track and record detailed electric operational history when operating equipment above nameplate capacities at the circuit level. iii) Utility uses predictive modeling to shorten the expected life of equipment based on grid operating history	and record detailed electric operational history when operating equipment above nameplate capacities at the circuit level. iii) Utility uses predictive modeling to shorten the expected life of equipment based on grid operating history, iv) and the utility has the predictive model reviewed by external experts and verified using historical data	automatically track and record detailed electric operational history when operating equipment above nameplate capacities at the circuit level. iii) Utility uses predictive modeling to shorten the expected life of equipment based on grid operating history, iv) and the utility has the predictive model reviewed by external experts and verified using historical data, v) and never operates grid above rated capacities in HFTD areas
29. PSPS operating model and consequence mitigation	PSPS event frequently forecasted incorrectly and poorly communicated to affected customers	PSPS event i) generally forecasted accurately with fewer than 50% of predictions being false positives where ignition would not have been likely to occur, ii) and communicated to >95% of affected	PSPS event i) generally forecasted accurately with fewer than 33% of predictions being false positives where ignition would not have been likely to occur, ii) and communicated to	PSPS event i) generally forecasted accurately with fewer than 33% of predictions being false positives where ignition would not have been likely to occur, ii) and communicated to >99% of affected customers iii) and >99.9% of medical baseline	PSPS event i) generally forecasted accurately with fewer than 25% of predictions being false positives where ignition would not have been likely to occur, ii) and communicated to >99.9% of affected

	Maturity level				
Capability	**0**	**1**	**2**	**3**	**4**
		customers iii) and >99% of medical baseline customers in advance of PSPS action, iv) no website downtime, v) and fewer than 1 hrs. of average PSPS time per customer per year, vi) utility has developed resources to mitigate PSPS consequence, including providing water, phone charging, other resources to all affected by PSPS	>98% of affected customers iii) and >99.5% of medical baseline customers in advance of PSPS action, iv) with fewer than 0.5% of customers complaining, and v) no website downtime, vi) and fewer than 0.5 hrs. of average PSPS per customer per year, vii) utility has developed resources to mitigate PSPS consequence, including providing water, phone charging, and other resources to all affected by PSPS	customers in advance of PSPS action, iv) with fewer than 0.5% of total customers complaining, and v) no website downtime, and vi) specific resources provided to customers to alleviate the consequence of the power shutoff (e.g., providing backup generators, supplies, batteries, etc.), and vii) fewer than 0.25 hrs. of PSPS per customer per year, viii) utility has developed resources to mitigate PSPS consequence, including providing water, phone charging, and other resources to all affected by PSPS	customers iii) and 100% of medical baseline customers in advance of PSPS action, iv) with fewer than 0.5% of total customers complaining, and v) no website downtime, and vi) specific resources provided to customers to alleviate the consequence of the power shutoff (e.g., providing backup generators, supplies, batteries, etc.), and vii) and fewer than 0.1 hrs. of PSPS per customer per year

	Maturity level				
Capability	**0**	**1**	**2**	**3**	**4**
30. Protocols for PSPS initiation	Utility has no well-defined and clearly explained threshold for PSPS activation	Utility has i) explicit policies and explanation for the thresholds above which PSPS is activated as a measure of last resort, ii) SME opinion is used as an input into PSPS decisions.	Utility has i) explicit, objective policies and explanation for the thresholds above which PSPS is activated as a measure of last resort, ii) PSPS decisions are supported by a partially automated system that recommends circuits for which PSPS should be activated, which is validated by SMEs.	Utility i) de-energizes circuits only upon detection of damaged condition of electric lines and equipment or contact with foreign objects or when the circuit presents a safety risk to suppression and other personnel.	Utility i) maintains grid in sufficiently low risk condition to not require any PSPS events and ii) the only circuits de-energized are those with sufficient redundancy to create no disruption in energy supply to customers or as a measure of last resort, iii) utility may de-energize specific circuits upon detection of damaged condition of electric lines and equipment or contact with foreign objects.

	Maturity level				
Capability	**0**	**1**	**2**	**3**	**4**
31. Protocols for PSPS re-energization	Inadequate process for inspecting de-energized sections of the grid prior to re-energization	i) Manual process to accurately inspect de-energized sections of the grid prior to re-energization, ii) ensure grid is returned to service within 24 hours after weather has returned to below utility's PSPS threshold.	i) Partially automated process (e.g., using drones, LiDAR, etc.) to accurately inspect de-energized sections of the grid prior to re-energization, ii) ensure grid is returned to service within 18 hours after de-energization weather has returned to below utility's PSPS threshold iii) and causing 0 after-event ignitions.	i) Mostly automated process (e.g., using drones, LiDAR, etc.) augmented ii) with sensors and aerial tools to accurately inspect de-energized sections of the grid prior to re-energization to iii) ensure grid is returned to service within 12 hours after de-energization weather has returned to below utility's PSPS threshold, iv) and causing 0 after-event ignitions	i) Primarily automated process (e.g., using drones, LiDAR, etc.) augmented ii) with sensors and aerial tools to accurately inspect de-energized sections of the grid prior to re-energization to iii) ensure grid is returned to service within 8 hours after de-energization weather has returned to below utility's PSPS threshold, iv) and causing 0 after-event ignitions
32. Ignition prevention and suppression	Utility has no policies governing what personnel roles are in suppressing ignitions, and personnel are untrained	Utilities have i) explicit policies about the role of personnel at the site of ignition, ii) including providing training and communication tools to immediately report ignitions caused by workers or in immediate vicinity of workers, iii) with no	Utilities have i) explicit policies about the role of personnel, including contractors and subcontractors at the site of ignition, ii) including providing training, suppression tools, and communication tools, iii) to suppress ignitions	Utilities have i) explicit policies about the role of personnel, including contractors and subcontractors at the site of ignition, ii) including providing training provided by suppression professionals, a variety of suppression tools, and robust communication tools	Utilities have i) explicit policies about the role of personnel, including contractors and subcontractors at the site of ignition, ii) including providing training provided by suppression professionals, a variety of suppression tools, and robust communication tools

	Maturity level				
Capability	**0**	**1**	**2**	**3**	**4**
		major injuries or fatalities to workers	caused by workers or in immediate vicinity of workers, iv) with no OSHA reportable injuries or fatalities to workers	that function without cell reception, iii) to suppress ignitions caused by workers or in immediate vicinity of workers, iv) with no major injuries or fatalities to workers	that function without cell reception, and requiring contractors to provide the same, iii) to suppress small ignitions caused by workers or in immediate vicinity of workers, iv) with no major injuries or fatalities to workers; v) and share risk reduction and suppression training materials and techniques with other utilities

Category G: Data collection and reporting

Illustrative descriptions that may represent typical grades—not comprehensive

	Maturity level				
Capability	**0**	**1**	**2**	**3**	**4**
33. Data collection and curation	Situational, operational, and risk data not collected in a centralized database	Utility has i) centralized repository of accurate situational, operational, and risk data, ii) but does not use them to make short-term/operational and long-term/ investment decisions	Utility has centralized repository of i) accurate situational, operational, and other data relevant to wildfire risk and PSPS, ii) collects data from all sensored portions of electric lines and equipment, weather stations, etc., and iii) is able to utilize advanced analytics to drive decision-making in short term	Utility has centralized repository of i) accurate situational, operational, and risk data, ii) collects data from all sensored portions of electric lines and equipment, weather stations, etc., iii) is able to utilize advanced analytics to drive decision-making in short and long-term, iv) is able to ingest and share data using real-time API protocols with a wide variety of stakeholders	Utility has centralized repository of i) accurate situational, operational, and risk data, and ii) collects data from all sensored portions of electric lines and equipment, weather stations, etc. iii) is able to utilize advanced analytics to drive decision-making in short and long-term, iv) identify new sources of data needed for decision making, v) and to share best practices with other utilities in California and beyond, vi) is able to ingest and share data using real-time API protocols with a wide variety of stakeholders

	Maturity level				
Capability	**0**	**1**	**2**	**3**	**4**
34. Data transparency and analytics	No central catalogue of all wildfire-related data and algorithms, analyses, and data processes	All wildfire-related data and algorithms used by utilities i) catalogued in a single document, ii) including an explanation of the sources, and assumptions made; and iii) all analysis and algorithms documented	All wildfire-related data and algorithms used by utilities i) catalogued in a single document, ii) including an explanation of the sources and assumptions made; iii) all wildfire-related analyses, algorithms, and data processing explained and documented; and iv) an IT system for sharing data in real time across at least two levels of permissions, including a. utility-regulator permissions, b. first responder permissions.	All wildfire-related data and algorithms used by utilities i) catalogued in a single document, ii) including an explanation of the sources and assumptions made, cleaning processes, and assumptions made in the data; iii) all analyses, algorithms, and data processing explained and documented, iv) most relevant wildfire related data and algorithms disclosed to regulators and other relevant stakeholders, v) an IT system for sharing data in real time across at least three levels of permissions, including a. utility-regulator permissions, b. first responder permissions, and c. public data sharing.	All wildfire-related data and algorithms used by utilities i) catalogued in a single document, ii) including an explanation of the sources and assumptions made, cleaning processes, and assumptions made in the data; iii) all analyses, algorithms, and data processing explained and documented, with iv) sensitivities disclosed for each type of analysis and data to at least the regulator; v) most relevant wildfire related data and algorithms disclosed publicly in WMP; and vi) an IT system for sharing data in real time across at least three levels of permissions, including a. utility-regulator permissions, b. first responder permissions, and c. public data sharing.

	Maturity level				
Capability	**0**	**1**	**2**	**3**	**4**
35. Risk event tracking	No tracking of risk event data	Tracking of risk event data for all risk events with wildfire ignition potential and associated event characteristics, including capturing data related to the specific mode of failure	Tracking of i) risk event data for all risk events with wildfire ignition potential, ii) event characteristics and fuel loads and moisture to enable simulation of wildfire potential given an ignition, iii) including capturing data related to the specific mode of failure	Tracking of i) risk event data for all risk events with wildfire ignition potential, ii) event characteristics to enable simulation of wildfire potential given an ignition, iii) and predicting the probability of such a risk event in causing an ignition, iv) including capturing data related to the specific mode of failure	Tracking of i) risk event data for all risk events with wildfire ignition potential, ii) event characteristics to enable simulation of wildfire potential given an ignition, iii) and predicting the probability of such a risk event in causing an ignition, iv) using data from risk events to change grid operation protocols in real time, v) including capturing data related to the specific mode of failure
36. Data sharing with research community	Utility fails to share data or participate in research	Utility does not share data beyond disclosures expected under applicable rules, nor does it participate in collaborative research	Utility participates in i) collaborative research that ii) addresses utility-ignited wildfires	Utility i) funds and ii) participates in both independent and collaborative research that iii) addresses utility-ignited wildfires, and risk reduction initiatives	Utility i) funds and ii) participates in both independent and collaborative research that iii) addresses utility-ignited wildfires, and risk reduction initiatives, iv) and promotes best practices, based on the latest independent scientific and operational research, and v) ensures that research, where

	Maturity level				
Capability	**0**	**1**	**2**	**3**	**4**
					possible, is abstracted to apply to other utilities

Category H: Resource allocation methodology, business case, and sensitivities

Illustrative descriptions that may represent typical grades—not comprehensive

	Maturity level				
Capability	**0**	**1**	**2**	**3**	**4**
37. Scenario analysis across different risk levels	Utility does not project proposed initiatives or costs across different levels of risk scenarios	Utility i) provides at least an accurate high-risk reduction and a low risk reduction scenario and ii) projected cost and total risk reduction potential for each region	Utility i) provides at least an accurate high-risk reduction and a low risk reduction scenario in addition to ii) their proposed scenario and iii) shows the projected cost and total risk reduction iv) potential for each circuit	Utility i) provides at least an accurate high-risk reduction and a low risk reduction scenario in addition to ii) their proposed scenario and iii) shows the projected cost and total risk reduction iv) potential for each scenario within each span	Utility i) provides at least an accurate high risk reduction and a low risk reduction scenario in addition to ii) their proposed scenario and iii) shows the projected cost and total risk reduction iv) potential for each scenario at each asset, v) and includes a long-term (e.g. 6-10 year) risk estimate taking into account macro factors (climate change, etc.) as well as planned risk reduction initiatives, and vi) utility includes estimate of impact on reliability factors
38. Presentation of relative risk-spend efficiency for	Utility does not present relative risk-spend efficiency figures across initiatives	Utility provides i) accurate qualitative ranking of ii) common commercial initiatives by risk-spend efficiency, and iii)	Utility provides i) accurate qualitative ranking of ii) all commercial initiatives by risk-spend efficiency, and iii)	Utility provides i) accurate qualitative ranking of ii) all commercial initiatives by risk-spend efficiency, and iii)	Utility provides i) accurate qualitative ranking of ii) all commercial initiatives and emerging initiatives by risk-spend efficiency, and iii)

	Maturity level				
Capability	**0**	**1**	**2**	**3**	**4**
portfolio of initiatives		includes figures for estimated cost and projected risk reduction impact of each initiative, iv) for each region, and v) explanation of their investment in each initiative	includes figures for estimated cost and projected risk reduction impact of each initiative, iv) in each circuit of their grid, and v) explanation of their investment in each particular initiative	includes figures for estimated PV cost and projected risk reduction impact of each initiative, iv) in each span, and v) explanation of their investment in each particular initiative, and vi) the expected overall reduction in risk	includes figures for estimated cost and projected risk reduction impact of each initiative, iv) for each asset, and v) explanation of their investment in each particular initiative and vi) the expected overall reduction in risk from each asset and the grid overall and vii) utility includes estimate of impact on SAIDI factors
39. Process for determining risk-spend efficiency of vegetation management initiatives	Utility has no clear understanding of the relative risk-spend efficiency of various clearances and types of vegetation management initiatives	Utility has i) accurate relative understanding of the ii) cost, and iii) effectiveness to produce a iv) reliable risk-spend efficiency estimate of v) commonly deployed vegetation management initiatives vi) in each area of the utility's grid	Utility has i) accurate relative understanding of the ii) cost, and iii) effectiveness to produce a iv) reliable risk-spend efficiency estimate of v) all vegetation management initiatives deployed in California vi) for each circuit of the utility's grid vii) updated on an annual basis	Utility has i) accurate quantitative understanding of the ii) cost, including sensitivities, and iii) effectiveness to produce a iv) accurate risk-spend efficiency estimate of v) all feasible vegetation management initiatives vi) for each span along the utility's grid vii) updated on an annual basis	Utility has i) accurate quantitative understanding of the ii) cost, including sensitivities, and iii) effectiveness to produce a iv) accurate risk-spend efficiency estimate of v) all feasible vegetation management initiatives, vi) supported by independent testing, vii) around each asset along the utility's grid viii) updated on an annual basis, ix)

	Maturity level				
Capability	**0**	**1**	**2**	**3**	**4**
					including risk reduction effect from the combination of various initiatives
40. Process for determining risk-spend efficiency of system hardening initiatives	Utility has no clear understanding of the relative risk-spend efficiency of hardening initiatives	Utility has i) accurate relative understanding of the ii) cost, and iii) effectiveness to produce a iv) reliable risk-spend efficiency estimate of v) commonly deployed and commercially available grid hardening initiatives vi) in each area of the utility's grid	Utility has i) accurate relative understanding of the ii) cost, and iii) effectiveness to produce a iv) reliable risk-spend efficiency estimate of v) commonly deployed and commercially available grid hardening initiatives vi) for each **circuit** of the utility's grid vii) updated on an annual basis	Utility has i) accurate quantitative understanding of the ii) cost, including sensitivities, and iii) effectiveness to produce a iv) reliable risk-spend efficiency estimate of v) all commercially available grid hardening initiatives vi) for each **span** along the utility's grid vii) updated on an annual basis	Utility has i) accurate quantitative understanding of the ii) cost, including sensitivities, and iii) effectiveness to produce a iv) reliable risk-spend efficiency estimate of v) all commercially available grid hardening initiatives, vi) and those initiatives that are lab-tested, vii) for each **asset** along the utility's grid viii) updated on an annual basis, ix) including risk reduction effect from the combination of various initiatives

	Maturity level				
Capability	**0**	**1**	**2**	**3**	**4**
41. Portfolio-wide initiative allocation methodology	Utility does not allocate capital to wildfire risk reduction initiatives based on wildfire risk-spend efficiency	Utility i) allocates spend within each category of wildfire risk reduction initiative ii) by accurate risk-spend efficiency estimates iii) but does not allocate spend across categories of initiatives (e.g. prioritizing between vegetation management and grid hardening)	Utility i) allocates spend across all categories of wildfire risk reduction initiatives ii) by accurate risk-spend efficiency estimates iii) across various categories using an average estimate of risk-spend efficiency for each initiative across the entire grid	Utility i) allocates spend across all categories of wildfire risk reduction initiatives ii) by accurate risk-spend efficiency estimates iii) based on the current state of the utility's equipment and the specific location or area of grid where the initiative is to be implemented; iv) which is verified by experimental data confirmed by experts and other utilities in CA	Utility i) allocates spend across all categories of wildfire risk reduction initiatives ii) by accurate risk-spend efficiency estimates iii) based on the current state of the utility's equipment at the asset level where the initiative is to be implemented and iv) utility includes estimate of impact on reliability factors; v) which is verified by experimental data confirmed by experts and by other utilities in California or abroad
42. Portfolio-wide innovation in new wildfire initiatives	No established program for evaluating the wildfire risk and risk-spend efficiency of new wildfire initiatives	New initiatives developed and evaluated based on i) piloting and ii) measuring direct reduction in ignition events	New initiatives developed and evaluated based on i) piloting initiatives and ii) measuring direct reduction in ignition events and iii) measuring reduction impact on risk event metrics; iv) including an evaluation of the total cost of the initiative	New initiatives i) developed and independently evaluated using lab facilities by a trained team of innovation specialists, followed by ii) in-field testing based on piloting and iii) measuring direct reduction in ignition events at a span level	New initiatives i) developed and independently evaluated using lab facilities by a trained team of innovation specialists, ii) field testing done by piloting, and iii) measuring direct reduction in ignition events and iv)

	Maturity level				
Capability	**0**	**1**	**2**	**3**	**4**
				and iv) measuring reduction in impact on risk event metrics; v) including an evaluation of the total cost of the initiative	measuring reduction impact on risk event metrics v) independent auditing of performance; vi) extensive data sharing with industry, academia, and other utilities utilizing the same initiatives to share results; vii) including an evaluation of the total cost of initiative

Category I: Emergency planning and preparedness

Illustrative descriptions that may represent typical grades—not comprehensive

	Maturity level				
Capability	**0**	**1**	**2**	**3**	**4**
43. Wildfire plan integrated with overall disaster / emergency plan	Wildfire plan not integrated with overall disaster and emergency preparedness plan	Wildfire plan i) a component of overall disaster and emergency preparedness plan; ii) running in drills to audit the viability and execution of plans	Wildfire plan i) an integrated component of overall disaster and emergency preparedness plan, with ii) consequence of confounding events or multiple simultaneous disasters considered in planning process, iii) running in drills to audit the viability and execution of plans across incident types	Wildfire plan i) an integrated component of overall disaster and emergency preparedness plan, with ii) consequence of confounding events or multiple simultaneous disasters considered in planning process, and iii) plan integrated with disaster and emergency preparedness plan of other relevant stakeholders (e.g. Cal Fire, Fire Safe Councils, etc.) iv) coordinating planning and integrating plans across stakeholders; and v) participating in drills to audit the viability and execution of plans across stakeholders	Wildfire plan i) an integrated component of overall disaster and emergency preparedness plan, with ii) consequence of confounding events or multiple simultaneous disasters considered in planning process, and iii) plan integrated with disaster and emergency preparedness plan of other relevant stakeholders (e.g. Cal Fire, Fire Safe Councils, etc.), iv) with utility taking a leading role in planning, coordinating, and integrating plans across stakeholders, and leading efforts to run drills to audit the viability and execution of plans across stakeholders

	Maturity level				
Capability	**0**	**1**	**2**	**3**	**4**
44. Plan to restore service after wildfire related outage	Wildfire plan not integrated with overall disaster and emergency preparedness plan	Wildfire plan i) a component of overall disaster and emergency preparedness plan; ii) running in drills to audit the viability and execution of plans	Wildfire plan i) an integrated component of overall disaster and emergency preparedness plan, with ii) consequence of confounding events or multiple simultaneous disasters considered in planning process, iii) running in drills to audit the viability and execution of plans across incident types	Wildfire plan i) an integrated component of overall disaster and emergency preparedness plan, with ii) consequence of confounding events or multiple simultaneous disasters considered in planning process, and iii) plan integrated with disaster and emergency preparedness plan of other relevant stakeholders (e.g. Cal Fire, Fire Safe Councils, etc.) iv) coordinating planning and integrating plans across stakeholders; and v) participating in drills to audit the viability and execution of plans across stakeholders	Wildfire plan i) an integrated component of overall disaster and emergency preparedness plan, with ii) consequence of confounding events or multiple simultaneous disasters considered in planning process, and iii) plan integrated with disaster and emergency preparedness plan of other relevant stakeholders (e.g. Cal Fire, Fire Safe Councils, etc.), iv) with utility taking a leading role in planning, coordinating, and integrating plans across stakeholders, and leading efforts to run drills to audit the viability and execution of plans across stakeholders
45. Emergency community engagement during and after wildfire	Little community engagement or poor communication during and after wildfire	i) Clear and substantially complete communication of available utility-related information ii) to >95% of affected customers,	i) Clear and substantially complete communication of available utility-related information ii) to >98% of affected customers,	Clear and substantially complete communication of utility-related information to >99% of affected customers ii)	Utility i) communicates to >99.9% of affected customers ii) and 100% of affected medical baseline customers, iii) has detailed and

	Maturity level				
Capability	**0**	**1**	**2**	**3**	**4**
		and iii) >99% of affected medical baseline customers, as well as referral to other agencies, iv) links to relevant evacuation information prominently on website and via toll-free phone number	and iii) >99.5% of affected medical baseline customers, as well as referral to other agencies, iv) availability of relevant evacuation information and links prominently on website and via toll-free phone number	and >99.9% of affected medical baseline customers iii) has detailed and actionable established protocols for cooperation with emergency management organizations iv) availability of relevant evacuation information and links prominently on website and via toll-free phone number, v) and assists where helpful with communication of information related to power outages to customers, as well as partnering with other agencies to refer those affected to relevant assistance and resources	actionable established protocols for cooperation with emergency management organizations iv) availability of relevant evacuation information and links prominently on website and via toll-free phone number and v) assists where helpful with communication of information related to power outages to customers, and vi) communicates and coordinates resources to communities during emergencies (e.g., shelters, supplies, transportation etc.)
46. Protocols in place to learn from wildfire events	No defined protocols established to learn from wildfire events	Protocols in place to i) record outcome of emergency events and to ii) clearly and actionably document learnings and potential process improvements,	Protocols in place to i) record outcome of emergency events and to ii) clearly and actionably document learnings and potential process improvements,	Protocols in place to i) record outcome of emergency events and to ii) clearly and actionably document learnings and potential process improvements,	Protocols in place to i) record outcome of emergency events and to ii) clearly and actionably document learnings and potential process improvements,

	Maturity level				
Capability	**0**	**1**	**2**	**3**	**4**
		iii) including a defined process and staff responsible for incorporating learnings into emergency plan	iii) including a defined process and staff responsible for incorporating learnings into emergency plan, and iv) having subject matter experts assess the effectiveness of the updated plan	iii) including a defined process and staff responsible for incorporating learnings into emergency plan, and iv) testing updated plan using "dry runs" and subject matter experts to confirm effectiveness of updated plan	iii) including a defined process and staff responsible for incorporating learnings into emergency plan, and iv) testing updated plan using "dry runs" and subject matter experts to confirm effectiveness of updated plan; v) including a defined process to solicit input from variety of other stakeholders and defined process to incorporate learnings from other stakeholders into emergency plan
47. Processes for continuous improve-ment after wildfire and PSPS	Utility does not conduct an evaluation or debrief process after a wildfire event.	Utility i) conducts a customer survey and utilized partners to disseminate ii) utility also debriefs with partners about what can be improved, iii) feedback and recommendations on potential improvements are made public.	Utility i) conducts a customer survey and utilized partners to disseminate ii) conducts proactive outreach to local agencies and organizations to solicit additional feedback on what can be improved iii) feedback and recommendations on potential	Utility has i) a clear plan for post-event listening and incorporating lessons learned from all stakeholders, ii) activities include debriefs, public listening sessions, surveys, and additional measures available to the public, iii) feedback is compiled, written,	Utility has i) a clear plan for post-event listening and incorporating lessons learned from all stakeholders, ii) activities include debriefs, public listening sessions, surveys, and additional measures available to the public, iii) feedback is compiled, written,

	Maturity level				
Capability	**0**	**1**	**2**	**3**	**4**
			improvements are made public.	and recommended actions are made public. Implementation of recommendations is tracked and reported on	and recommended actions are made public, implementation of recommendations is reported on and tracked, iv) utility further has an established process to conduct reviews after wildfires in other the territory of other utilities and states to identify and address areas of improvement

Category J: Stakeholder cooperation and community engagement

Illustrative descriptions that may represent typical grades—not comprehensive

	Maturity level				
Capability	**0**	**1**	**2**	**3**	**4**
48. Cooperation and best practice sharing with other utilities	Utility does not adopt lessons learned from other utilities	Utility has a i) clearly defined operational process in place to ii) exchange best practices with other California utilities iii) tests lessons learned from other utilities to ensure local applicability	Utility i) actively seeks best practices from utilities, ii) successfully implements relevant best practices, and iii) seeks to share best practices and lessons learned in a consistent format iv) tests lessons learned from other utilities to ensure local applicability	Utility i) actively seeks best practices from utilities, ii) successfully implements relevant best practices, and iii) seeks to share best practices and lessons learned in a consistent format, and iv) via a consistent and predictable set of venues/media, v) and participates in annual benchmarking exercises with other utilities to find areas for improvement vi) implement a process for testing lessons learned from other utilities to ensure local applicability	Utility i) actively seeks best practices from utilities, ii) successfully implements relevant best practices, and iii) seeks to share best practices and lessons learned in a consistent format, and iv) via a consistent and predictable set of venues/media, v) and participates in annual benchmarking exercises with other utilities to find areas for improvement and vi) implement a defined process for testing and adapting lessons learned from other utilities to ensure local applicability
49. Engagement with communities on utility	Utility has poor relationship with local communities, impairing ability to implement initiatives	Utility has i) clear and actionable plan to develop or maintain a collaborative relationship with local	Utility has i) clear and actionable plan to develop or maintain a collaborative relationship with local	Utility has i) clear and actionable plan to develop or maintain a collaborative relationship with local	Utility has demonstrably cooperative relationship with local communities, and i)

	Maturity level				
Capability	**0**	**1**	**2**	**3**	**4**
wildfire mitigation initiatives		communities, ii) enables utility to implement initiatives (e.g., conduct vegetation management) iii) with fewer than 10% of land owners in utility territory preventing or significantly hindering the utility's performance of reasonable vegetation work, and iv) complaints from fewer than 5% of landowners	communities, ii) enables utility to implement initiatives (e.g., conduct vegetation management) iii) with fewer than 3% of land owners in utility territory preventing or significantly hindering the utility's performance of reasonable vegetation work, and iv) complaints from fewer than 2% of landowners	communities, ii) enables utility to implement initiatives (e.g., conduct vegetation management) iii) with fewer than 2% of land owners in utility territory preventing or significantly hindering the utility's performance of reasonable vegetation work, and iv) complaints from fewer than 1% of landowners	clear and actionable plan to develop or maintain a collaborative relationship with local communities, ii) enables utility to implement initiatives (e.g., conduct vegetation management) iii) with fewer than 1% of land owners in utility territory preventing or significantly hindering the utility's performance of reasonable vegetation work, and iv) complaints from fewer than 1% of landowners; and v) landowners periodically reach out to utility to notify of risks, dangers, or issues
50. Engagement with AFN populations	Utility has poor relationships with key organizations representing AFN communities, impairing ability to implement initiatives.	Utility has i) a plan for partnering with organizations representing AFN communities, and ii) is able to provide information about the nature of these partnerships	Utility has i) a clear and actionable plan to develop and maintain collaborative relationships with organizations representing AFN communities, with ii) pathways for	Utility has i) a clear and actionable plan to develop and maintain ii) demonstrably cooperative and codified relationships with organizations representing AFN communities, and iii)	Utility has i) a clear and actionable plan to develop and maintain ii) demonstrably cooperative and codified relationships with organizations representing AFN communities, and iii)

	Maturity level				
Capability	**0**	**1**	**2**	**3**	**4**
			implementing suggested activities to address population needs	can point to clear examples of how those relationships have driven the utility's ability to interact with and prepare these populations for wildfire mitigation activities.	can point to clear examples of how those relationships have driven the utility's ability to interact with and prepare these populations for wildfire mitigation activities, and has a specific annually updated action plan further reduce wildfire and PSPS risk to these communities
51. Collaboration with emergency response agencies	Utility does not sufficiently cooperate with suppression agencies	Utility cooperates with suppression agencies by i) calling in ignitions detected along length of grid for ii) high risk areas	Utility cooperates with suppression agencies by i) calling in ignitions detected along length of grid ii) for all areas under utility control	i) Utility works cooperatively with suppression agencies to detect wildfires in the utility's service area, ii) alerts suppression resources, and iii) accurately predict and communicates the forecasted fire propagation path using available analytics resources and weather data	i) Utility works cooperatively with suppression agencies to detect wildfires in the utility's service area, ii) alerts suppression resources, and iii) accurately predict and communicates the forecasted fire propagation path using available analytics resources and weather data, iv) communicates fire path to community if requested, and v) utility works to assist suppression personnel

	Maturity level				
Capability	**0**	**1**	**2**	**3**	**4**
					logistically where possible
52. Collaboration on wildfire planning with stakeholders	Utility does not collaborate with other agencies conducting non-emergency wildfire planning and initiatives to reduce wildfire risk.	Utility i) coordinates on a regular basis with other agencies including all Fire Safe Councils within its territory and ii) conduct fuel management along right of ways but iii) is not coordinating with broader fuel management efforts by other stakeholders	Utility i) coordinates on a regular basis with other agencies including all Fire Safe Councils within its territory and ii) conducts substantial fuel management along right of ways and iii) shares fuel management plans with other stakeholders, iv) works with other stakeholders conducting fuel management concurrently	Utility i) coordinates on a regular basis with other agencies including all Fire Safe Councils within its territory and ii) conducts substantial fuel management along right of ways, iii) shares fuel management plans and iv) coordinates fuel management activities, including adjusting plans, to cooperate with other stakeholders state-wide to focus on areas that would have the biggest impact in reducing wildfire risk, v) cultivates a native vegetative ecosystem along right of ways that is consistent with lower fire risk, and work with stakeholders across its territory to cultivate a native vegetative ecosystem	Utility i) coordinates on a regular basis with other agencies including all Fire Safe Councils within its territory and ii) conducts substantial fuel management in service area, iii) shares fuel management plans and iv) pro-actively coordinates fuel management initiatives with other stakeholders to encourage state-wide to collaborate to focus on areas that would have the biggest impact in reducing wildfire risk, v) utility funds local groups (e.g. fire safe councils) to support fuel management, vi) cultivates a native vegetative ecosystem along right of ways that is consistent with lower fire risk and work with stakeholders across its

	Maturity level				
Capability	**0**	**1**	**2**	**3**	**4**
					territory to cultivate a native vegetative ecosystem

DATA DRIVEN
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