



April 3, 2024

Dear Stakeholders,

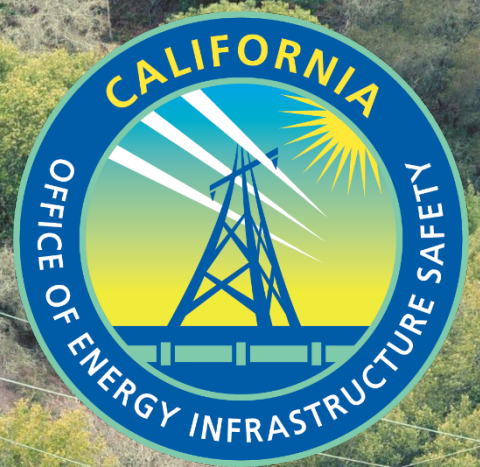
Enclosed is the Office of Energy Infrastructure Safety's Annual Report on Compliance regarding Southern California Edison Company's execution of its 2021 Wildfire Mitigation Plan.

This Annual Report on Compliance is hereby published as of the date of this letter. Southern California Edison Company may, if it wishes to do so, file a public response to this Annual Report on Compliance within 14 calendar days of the date of publication. Comments must be submitted to the Office of Energy Infrastructure Safety's E-Filing system in the 2021 Annual Report on Compliance docket.

Sincerely,

Patrick Doherty

Patrick Doherty
Program Manager | Compliance Assurance Division
Electrical Infrastructure Directorate
Office of Energy Infrastructure Safety



OFFICE OF ENERGY INFRASTRUCTURE SAFETY
ANNUAL REPORT ON COMPLIANCE
SOUTHERN CALIFORNIA EDISON COMPANY
2021 WILDFIRE MITIGATION PLAN UPDATE

April 2024

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Executive Summary

The Office of Energy Infrastructure Safety (Energy Safety) is tasked with evaluating and either approving or denying the Wildfire Mitigation Plans (WMPs) or WMP Updates annually filed by electrical corporations pursuant to Public Utilities Code sections 8386 et seq. Pursuant to Public Utilities Code section 8386.3, Energy Safety oversees compliance by an electrical corporation with its WMP or WMP Update.

Energy Safety considered the totality of all compliance assessments completed with respect to Southern California Edison Company's (SCE's) approved 2021 WMP Update, including audits, field inspections, and analysis of data submitted by SCE to Energy Safety. Energy Safety considered SCE's self-assessment in its Electrical Corporation Annual Report on Compliance and the findings of its independent evaluator. Energy Safety also compared metrics related to SCE's performance including ignition, wire down, outage, and Public Safety Power Shutoff risk during the 2021 WMP Update compliance period.

Energy Safety's evaluation found that SCE completed the large majority (32 out of 39, or 82%) of its key 2021 WMP initiatives, including seven out of the top 10 initiatives with the largest allocated expenditure.

While SCE did not meet all targets for its WMP initiatives, the failure to meet certain targets did not materially hinder SCE's ability to mitigate its wildfire risk.

SCE had more ignitions on its system in 2021 compared to 2020 and to the average from recent years. This was true both on a total ignitions basis as well as when considered relative to the number of days where SCE's service territory saw higher risk of fire danger (Red Flag Warning Days). An increase in equipment/facility failure ignitions in Tier 3 and Tier 2 High Fire Thread Districts was a contributor to the overall increase in ignitions compared to the average from recent years. Although there was a higher rate of ignitions, the consequences were relatively minor overall. During 2021, SCE reported a reduction in acreage burned, no fatalities or injuries, and no structures damage.

SCE also reduced the scope, frequency, duration, and customers impacted by PSPS events in 2021 compared to 2020, though it still had a total PSPS duration of over 3.7 million customer hours and eight PSPS events.

Energy Safety acknowledges that SCE undertook significant efforts to reduce its wildfire risk, and in many instances, SCE achieved its objectives and targets. On balance, SCE was largely successful in executing an actionable and adaptive plan for wildfire risk mitigation. While Energy Safety found that SCE achieved its overarching WMP objectives, there are still areas for improvement and continued learning.

1. Introduction and Background

This Annual Report on Compliance (ARC) presents the Office of Energy Infrastructure Safety's (Energy Safety's) assessment of Southern California Edison Company's (SCE's) compliance with its 2021 Wildfire Mitigation Plan (WMP) Update.¹

SCE submitted its 2021 WMP Update on February 5, 2021. Energy Safety evaluated the WMP Update and issued a Revision Notice on May 4, 2021.² On June 4, 2021, SCE submitted a revised 2021 WMP Update.³ Energy Safety approved SCE's WMP on August 18, 2021.⁴

1.1 Legal Authority

Energy Safety is responsible for overseeing compliance with electrical corporations' WMPs.⁵ Energy Safety has broad authority to obtain and review information and data and to inspect property, records, and equipment of every electrical corporation in furtherance of its duties, powers, and responsibilities.⁶ In addition to performing an overall assessment of compliance⁷ with the WMP, Energy Safety audits each electrical corporation's vegetation management work for compliance with WMP requirements⁸ and performs other reviews and audits. Energy Safety may rely upon metrics⁹ to evaluate WMP Compliance, including performance metrics adopted by the California Public Utilities Commission (CPUC).¹⁰ Annually, in consultation with

¹ Public Utilities Code § 8386.3(c).

² California Public Utilities Commission, "Wildfire Safety Division's Revision Notice for Southern California Edison Company's 2021 WMP Update." May 4, 2021. [Online]. Available: <https://energysafety.ca.gov/wp-content/uploads/docs/misc/wmp/2021/utility/sce/sce-2021-wmp-revision-notice.pdf>

³ Southern California Edison, "2021 Wildfire Mitigation Plan Update (Revision)," Jun. 3, 2021. [Online]. Available: <https://www.sce.com/sites/default/files/AEM/Wildfire%20Mitigation%20Plan/2021/SCE%202021%20WMP%20Update%20Revision%20-%20CLEAN.pdf>

⁴ Office of Energy and Infrastructure Safety, "Final Evaluation of 2021 Wildfire Mitigation Plan Update Southern California Edison," Aug. 18, 2021. [Online]. Available: <https://efiling.energysafety.ca.gov/eFiling/Getfile.aspx?fileid=51701&shareable=true>

⁵ California Public Utilities Code § 8386.3(c).

⁶ California Government Code § 15475.

⁷ Public Utilities Code § 8386.3(c)(4).

⁸ Public Utilities Code § 8386.3(c)(5)(A).

⁹ Public Utilities Code § 326(a)(2).

¹⁰ Public Utilities Code § 8389(d)(4).

Energy Safety, the CPUC adopts a wildfire mitigation plan compliance process.¹¹ The CPUC adopted the 2021 Compliance Process via Resolution M-4860 on December 2, 2021.^{12, 13, 14}

1.2 Annual Compliance Process Cadence

Pursuant to Public Utilities Code section 8385(a)(1), a "compliance period" means a period of approximately one year. In its Compliance Operational Protocols issued on February 16, 2021, Energy Safety defined the compliance period for 2020-2022 WMPs as January 1 to December 31 for each calendar year of the three-year WMP.¹⁵

Public Utilities Code section 326(a)(3) requires Energy Safety to utilize visual inspection of electrical corporation infrastructure and wildfire mitigation programs as a means of assessing WMP compliance. Furthermore, Public Utilities Code section 8386.3(c) outlines the baseline statutory framework for assessing WMP compliance through a series of audits, reviews, and assessments performed by Energy Safety, independent evaluators, and the electrical corporations themselves. The statutory framework also lays out a defined timeframe for several of the compliance assessment components, as follows:

- Three months after the end of an electrical corporation's compliance period, each electrical corporation must submit an Electrical Corporation Annual Report on Compliance (EC ARC) addressing the electrical corporation's compliance with its plan during the prior calendar year.¹⁶
- Six months after the end of an electrical corporation's compliance period, an independent evaluator must submit an Independent Evaluator Annual Report on Compliance (IE ARC). The independent evaluators are engaged by each electrical corporation to review and assess the electrical corporation's compliance with its plan for the prior year. As a part of this report, the independent evaluator must determine whether the electrical corporation failed to fund any activities included in its plan.¹⁷
- In parallel with the above assessments, Energy Safety audits vegetation management activities. The results of the audit must specify any failure of the electrical corporation to fully comply with the vegetation management requirements in the WMP. Energy

¹¹ Public Utilities Code § 8389(d)(3).

¹² California Public Utilities Code § 8386.3(c)(4).

¹³ California Public Utilities Commission, "Resolution M-4860," Dec. 02, 2021. [Online]. Available: <https://docs.cpuc.ca.gov/PublishedDocs/Published/G000/M428/K722/428722129.PDF>

¹⁴ Office of Energy Infrastructure Safety, "Attachment 3: 2021 Wildfire Mitigation Plan Compliance Process," Oct. 13, 2021. [Online]. Available:

<https://docs.cpuc.ca.gov/PublishedDocs/Published/G000/M428/K146/428146324.pdf>

¹⁵ California Public Utilities Commission, "Compliance Operational Protocols," Feb. 16, 2021. p. 1. [Online]. Available: <https://energysafety.ca.gov/wp-content/uploads/docs/misc/wsd/2021.02.16-compliance-operational-protocols.pdf>

¹⁶ Public Utilities Code § 8386.3(c)(1).

¹⁷ Public Utilities Code § 8386.3(c)(2)(B)(i).

Safety then grants the electrical corporation a reasonable amount of time to correct and eliminate any deficiency specified in the audit.¹⁸ Subsequently, Energy Safety issues a report describing any failure of the electrical corporation to substantially comply with the substantial portion of the vegetation management requirements in the electrical corporation's WMP.¹⁹

- Within 18 months after the electrical corporation submits its compliance report pursuant to Public Utilities Code section 8386.3(c)(1), Energy Safety must complete its annual compliance review.^{20, 21, 22} Energy Safety memorializes the findings of its compliance review in this ARC.

¹⁸ Public Utilities Code § 8386.3(c)(5)(C).

¹⁹ *Id.*

²⁰ Public Utilities Code § 8386.3(c)(4)

²¹ California Public Utilities Commission, "Resolution M-4860," Dec. 2, 2021. [Online] Available:

<https://docs.cpuc.ca.gov/PublishedDocs/Published/G000/M428/K722/428722129.PDF>

²² Office of Energy Infrastructure Safety, "Compliance Process for 2021 Wildfire Mitigation Plans," Oct. 13, 2021. p. 2. [Online]. Available: <https://energysafety.ca.gov/wp-content/uploads/docs/compliance-process/docs/compliance-process-for-2021-wmps.pdf>

2. ARC Compliance Framework

Pursuant to Government Code section 15475.1, Energy Safety's primary objective is to ensure that electrical corporations reduce wildfire risk and comply with energy infrastructure safety measures. Each electrical corporation is required to construct, maintain, and operate its infrastructure in a manner that will minimize the risk of catastrophic wildfire.²³

Energy Safety's compliance assessment examines the totality of data and findings before the department. Compliance is the successful implementation of the electrical corporation's stated narratives, actions, targets, outcome metrics, and objectives in the electrical corporation's approved WMP, including providing supporting documentation. Energy Safety aims to ensure WMP implementation through the authorities and requirements outlined in Public Utilities Code sections 8386 – 8389.^{24, 25, 26}

Energy Safety considers the following as part of its assessment:

1. Whether the electrical corporation implemented the wildfire mitigation initiatives in its approved WMP, including evaluating whether the electrical corporation funded and performed the commitments stated for each initiative. Further, whether the electrical corporation prioritized completion of work with the highest potential for reducing wildfire risk.²⁷
2. Whether the electrical corporation achieved or sufficiently progressed its WMP objectives.
3. Wildfire risk reduction, including the performance of the electrical corporation's infrastructure relative to its wildfire risk, as measured by changes in the occurrence of events that correlate to wildfire risk.
4. Whether the electrical corporation made a good faith attempt to achieve its goals and comply with its WMP.
5. Whether the electrical corporation exhibited issues related to its execution, management, or documentation in the implementation of its WMP. This analysis may expand beyond the scope of any single WMP initiative.²⁸

²³ Public Utilities Code § 8386(a).

²⁴ Public Utilities Code § 8386.3(c)(4)

²⁵ California Public Utilities Commission, "Resolution M-4860," Dec. 2, 2021. [Online]. Available: <https://docs.cpuc.ca.gov/PublishedDocs/Published/G000/M428/K722/428722129.PDF>

²⁶ Office of Energy Infrastructure Safety, "Compliance Process for 2021 Wildfire Mitigation Plans," Oct. 13, 2021. p. 4. [Online]. Available: <https://energysafety.ca.gov/wp-content/uploads/docs/compliance-process/docs/compliance-process-for-2021-wmps.pdf>

²⁷ Energy Safety evaluates funding data to ensure electrical corporations are dedicating resources to their initiative commitments. Energy Safety does not evaluate whether the cost of implementing each electrical corporation's plan was just and reasonable.

²⁸ Office of Energy Infrastructure Safety, "Compliance Guidelines," Sept. 2023. p. 16. [Online]. Available: <https://efiling.energysafety.ca.gov/eFiling/Getfile.aspx?fileid=55586&shareable=true>

3. SCE 2021 WMP Update

This section provides a summary of SCE's commitments in its 2021 WMP Update. This section organizes SCE's commitments into two major categories:

1. 2021 WMP Update Objectives
2. 2021 WMP Update Initiatives

3.1 2021 WMP Update Objectives

The 2021 WMP Update Guidelines require each electrical corporation to describe the specific objectives of its 2021 WMP Update with respect to the following timeframes: Before the next Annual WMP Update; Within the next three years; and Within the next 10 years – long-term planning beyond the three-year cycle.²⁹

In reviewing compliance with SCE's 2021 WMP Update, Energy Safety considered whether SCE achieved or sufficiently progressed the objectives it set out to achieve before the next Annual WMP Update.

SCE's stated objective to achieve before the next Annual WMP Update was:

- Executing current WMP activities to develop capabilities, significantly harden the system, and reduce PSPS usage and impacts. This includes completion of all program targets and attainment of near-term wildfire strategy category objectives.³⁰

3.2 2021 WMP Update Initiatives

The 2021 WMP Update Guidelines required each electrical corporation to group its discussion of wildfire mitigation initiatives into the 10 categories listed in Table 1 below.

²⁹ California Public Utilities Commission, "Resolution WSD-011," Nov. 30, 2020. [Online]. Available: https://www.cpuc.ca.gov/-/media/cpuc-website/industries-and-topics/documents/wildfire/wildfire-2021/wsd_011_352490594.pdf

³⁰ Southern California Edison, "2021 Wildfire Mitigation Plan Update (Revision)," June 3, 2021. p. 104. [Online]. Available: <https://www.sce.com/sites/default/files/AEM/Wildfire%20Mitigation%20Plan/2021/SCE%202021%20WMP%20Update%20Revision%20-%20CLEAN.pdf>

SCE's 2021 WMP Update included a total of 47 initiatives allocated across all 10 categories.^{31, 32, 33}

Table 1 below provides a summary of SCE's allocation of WMP initiatives across categories, its reported planned expenditure in each category for 2021, and the percentage of the total 2021 WMP Update budget the expenditure in each category comprised.

Some initiatives provided quantitative targets (e.g., miles completed for system hardening initiatives). Other initiatives included qualitative measures (e.g., integration of all vegetation data into a singular database as a data governance initiative).

The majority of SCE's planned expenditure for this WMP cycle fell within three initiative categories: Grid Design and System Hardening, Asset Management and Inspections, and Vegetation Management and Inspections.³⁴

³¹ Southern California Edison, "2021 Wildfire Mitigation Plan Update (Revision)," June 3, 2021. Table 12. [Online]. Available: <https://www.sce.com/sites/default/files/AEM/Wildfire%20Mitigation%20Plan/2021/SCE%20Tables%201-12%20Revision.xlsx>

³² The 2021 WMP Update Guidelines provided ten initiatives categories: 1. Risk assessment and mapping, 2. Situational awareness and forecasting, 3. Grid design and system hardening, 4. Asset management and inspections, 5. Vegetation management and inspections, 6. Grid operations and protocols, 7. Data governance, 8. Resource allocation methodology, 9. Emergency planning and preparedness, and 10. Stakeholder cooperation and community engagement.

California Public Utilities Commission, "Attachment 2.2: 2021 Wildfire Mitigation Plan Guidelines Template," Nov. 2020. p. 43. [Online]. Available: <https://energysafety.ca.gov/wp-content/uploads/docs/wmp-2021/attachment-2.2-to-wsd-011-2021-wmp-guidelines-template.pdf>

³³ While SCE's 2021 WMP update included 47 initiatives, SCE's EC ARC only reported out on 39 initiatives. SCE combined some of the initiatives identified into one initiative for purposes of reporting for the EC ARC (e.g., WMP initiatives 7.3.2.6.1, 7.3.1.1, 7.3.1.3, and 7.3.1.5, for weather forecasting and estimating impacts on electric lines and equipment, were combined when reported in the EC ARC). Energy Safety did not approve the SCE change in initiative numbering from the WMP Update to the EC ARC.

Southern California Edison, "Southern California Edison Company's 2021 Wildfire Mitigation Plan Annual Report on Compliance," Mar. 31, 2022. p.2. [Online]. Available:

<https://efiling.energysafety.ca.gov/eFiling/Getfile.aspx?fileid=52229&shareable=true>

³⁴ Southern California Edison, "2021 Wildfire Mitigation Plan Update (Revision)," June 3, 2021. p.32-33. [Online]. Available:

<https://www.sce.com/sites/default/files/AEM/Wildfire%20Mitigation%20Plan/2021/SCE%202021%20WMP%20Update%20Revision%20-%20CLEAN.pdf>

Table 1: SCE's 2021 WMP Update Planned Expenditure by Category

Initiative Category	No of Initiatives	2021 Planned Expenditure (\$K)	% of 2021 WMP Update Planned Budget
1. Risk assessment and mapping	3	\$945	0.1%
2. Situational awareness and forecasting	8	\$45,102	2.6%
3. Grid design and system hardening	11	\$835,979	49.1%
4. Asset management and inspections	6	\$352,925	21.6%
5. Vegetation management and inspections	10	\$351,525	20.6%
6. Grid operations and protocols	1	\$55,773	3.3%
7. Data governance	1	\$16,761	1.0%
8. Resource allocation methodology	1	\$7,610	0.4%
9. Emergency planning and preparedness	2	\$14,313	0.8%
10. Stakeholder cooperation and community engagement	4	\$23,365	1.4%
Total	47	\$1,704,298 ³⁵	100%

³⁵ This figure represents the planned expenditure that SCE reported in Table 3-2 of its 2021 WMP Update Revision (page 32). All expenditures are presented in the (\$K). This figure is \$708,936 less than the total planned expenditure amount of \$2,413,234 that SCE reported in Table 12 which was also included with the 2021 WMP Update Revision (Attachment 2.3). This figure does not include \$665,578 in planned expenditure for eight (8) initiatives that SCE removed where it provided the following comment in the Table 12 Comment field "This activity is not considered by SCE to be a WMP activity and dollars/units represent SCE's full service area, not just its HFRA. Year initiated noted as "NA" as initiative started pre-GSRP/WMP." This figure also does not include \$43,359 in planned expenditure for five (5) Asset Management & Inspection initiatives where SCE noted in the Table 12 Comment field "Year initiated noted as "NA" as initiative started pre-GSRP/WMP." Southern California Edison, "Southern California Edison Company's 2021 Wildfire Mitigation Plan Update (Revision) (Table 3-2, pages 32-33; Attachment 2.3, Table 12, pg. 560)," June 3, 2021. [Online]. Available: <https://www.sce.com/sites/default/files/AEM/Wildfire%20Mitigation%20Plan/2021/SCE%202021%20WMP%20Update%20Revision%20-%20CLEAN.pdf>

Table 2 provides an overview of SCE's planned 2020-2022 WMP expenditure.

Table 2: SCE's Planned Expenditure by Year

Year	Planned Expenditure (\$K)
2020	\$1,308,269
2021	\$1,704,298
2022	\$1,783,476
2020-2022 Plan Period	\$4,844,696

Table 3 lists the top 10 initiatives by planned expenditure. The last row in Table 3 shows that SCE reported that the 10 listed initiatives (out of 47 in total) make up 89% of SCE's total 2021 WMP Update planned expenditure.³⁶

³⁶ Southern California Edison, "2021 Wildfire Mitigation Plan Update (Revision) (Table 12)," June 3, 2021. pp. 560- 562. [Online]. Available: <https://www.sce.com/sites/default/files/AEM/Wildfire%20Mitigation%20Plan/2021/SCE%202021%20WMP%20Update%20Revision%20-%20CLEAN.pdf>

Table 3: SCE's 2021 WMP Top 10 Planned Expenditure Initiatives³⁷

Initiative Number	Initiative	2021 Planned Expenditure (\$K) ³⁸	% of WMP Planned Budget
7.3.3.3.1	Covered conductor installation	\$753,659	44%
7.3.4.9.1	Other discretionary inspection of distribution electric lines and equipment, beyond inspections mandated by rules and regulations	\$252,123	15%
7.3.5.20	Vegetation management to achieve clearances around electric lines and equipment	\$182,747	11%
7.3.5.16.1	Removal and remediation of trees with strike potential to electric lines and equipment	\$80,722	5%
7.3.4.10	Other discretionary inspection of transmission electric lines and	\$75,939	5%
7.3.6.5	PSPS events and mitigation of PSPS impacts	\$55,773	3%
7.3.5.16.2	Removal and remediation of trees with strike potential to electric lines and equipment	\$43,445	3%

³⁷ Note: Table 2 in this report indicates a total planned expenditure of \$1,704,298 which is used to produce the % of 2021 WMP Planned Budget figures in the table.

Southern California Edison, "2021 Wildfire Mitigation Plan Update (Revision) (Table 3-1)," June 3, 2021. p. 32. [Online]. Available:

<https://www.sce.com/sites/default/files/AEM/Wildfire%20Mitigation%20Plan/2021/SCE%202021%20WMP%20Udpdate%20Revision%20-%20CLEAN.pdf>

³⁸ Southern California Edison, "Wildfire Safety Division Attachment 2.3 Wildfire Mitigation Plan Quarterly report (Table 12)," June 3, 2021. [Online]. Available:

<https://www.sce.com/sites/default/files/AEM/Wildfire%20Mitigation%20Plan/2021/SCE%20Tables%201-12%20Revision.xlsx>

Initiative Number	Initiative	2021 Planned Expenditure (\$K)³⁸	% of WMP Planned Budget
7.3.3.16	Undergrounding of electric lines and/or equipment	\$26,350	2%
7.3.4.3	Improvement of inspections	\$23,912	1%
7.3.3.2	Covered conductor installation	\$22,230	1%
Total		\$1,516,902	89%

4. Information Sources Used for ARC Assessment

Energy Safety relied upon the following sources of information to conduct its analysis for SCE's ARC:^{39, 40, 41}

1. Information provided by the electrical corporation via the EC ARC and quarterly initiative update (QIU).
2. Information provided by the independent evaluator via the IE ARC.
3. Findings from Energy Safety field inspections.
4. Findings from Energy Safety audits and assessments of the electrical corporation.
5. Data submitted to Energy Safety by the electrical corporation,⁴² including responses to data requests.
6. Information provided by third parties also engaged in assessment activities of the electrical corporation.

This section provides the most relevant information from the sources listed above for the purposes of Energy Safety's assessment of SCE's compliance with its 2021 WMP.

³⁹ Public Utilities Code § 8386.3(c)(4).

⁴⁰ California Public Utilities Commission, "Resolution M-4860," Dec. 2, 2021. [Online]. Available: <https://docs.cpuc.ca.gov/PublishedDocs/Published/G000/M428/K722/428722129.PDF>

⁴¹ Office of Energy Infrastructure Safety, "Attachment 3: 2021 Wildfire Mitigation Plan Compliance Process," Oct. 13, 2021. pp. 5-7. [Online]. Available: <https://energysafety.ca.gov/wp-content/uploads/docs/compliance-process/docs/compliance-process-for-2021-wmps.pdf>

⁴² Energy Safety receives data from the electrical corporation through three main paths: quarterly advice letter submissions, quarterly data request submissions, and quarterly initiative updates.

4.1 Electrical Corporation (EC) ARC

4.1.1 Background

Three months after the end of the compliance period, the electrical corporation must submit its EC ARC. The Compliance Operational Protocols outline the minimum requirements and structure for each electrical corporation's 2021 EC ARC.⁴³ The 2021 EC ARCs must include:

- An assessment of whether the electrical corporation achieved its risk reduction intent by implementing all of its approved WMP initiatives, i.e., the degree to which initiative activities have reduced ignition probabilities. If the electrical corporation failed to achieve the intended risk reduction, Energy Safety required the electrical corporation to provide a detailed explanation of why and reference where associated corrective actions were incorporated in its most recently submitted WMP.
- A full and complete listing of all change orders⁴⁴ and any other operational changes, such as initiative location changes, made to WMP initiatives, with an explanation of why the changes were necessary, and an assessment of whether the changes achieved the same risk reduction intent.
- Descriptions of all planned WMP initiative expenditures versus actual WMP initiative expenditures and an explanation of any differentials between the planned and actual expenditure.
- A description of whether the implementation of WMP initiatives changed the threshold(s) for triggering a PSPS event and/or reduced the frequency, scale, scope, and duration of PSPS events.
- A summary of all defects identified by Energy Safety within the annual compliance period, the corrective actions taken, and the completion and/or estimated completion date.

⁴³ California Public Utilities Commission, "Compliance Operational Protocols", Feb. 16, 2021. p. 10-12. [Online]. Available: <https://energysafety.ca.gov/wp-content/uploads/docs/misc/wsd/2021.02.16-compliance-operational-protocols.pdf>

⁴⁴ California Public Utilities Commission, "Resolution WSD-002," June 16, 2020. pp.32-35. [Online]. Available: <https://docs.cpuc.ca.gov/PublishedDocs/Published/G000/M340/K859/340859823.PDF>

4.1.2 Relevant Information

SCE timely submitted its EC ARC on March 31, 2022. In its EC ARC, SCE reported that it did not meet targets for six of its 39 initiatives.^{45, 46}

The six initiatives with missed targets were:

1. Fire Science Enhancements (7.3.2.4.4):
 - a. SCE's vendor developed a climatology output with a 40-year history of wildfires (including multiple variables), but did not complete the work because the vendor's work was reprioritized and shifted to support other emergent work (i.e., initiatives mitigating PSPS risk).⁴⁷
2. Vertical Switches (7.3.3.17.3):
 - SCE installed 16 of 20 vertical switches (80% of target).⁴⁸
3. Inspection Work Management Tools (7.3.4.3.1):
 - a. SCE missed several targets within the initiative including:
 - o Scope Mapping Tool - SCE did not meet the target to deploy the tool to Distribution Planning and Engineering users and implementation was delayed due to technical issues between the planned tool and existing datasets.
 - o SCE deployed remediation mobile software and iPad devices to transmission users, but not distribution users.
 - o Transmission Ground implementation and training was delayed due to offline syncing issues and data volume constraints.

⁴⁵ The 39 initiatives discussed in SCE's EC ARC is different from the 47 initiatives reported in its 2021 WMP Update (Table 1 above). SCE combined some of the initiatives identified into one initiative for purposes of reporting for the EC ARC (e.g., WMP initiatives 7.3.2.6.1, 7.3.1.1, 7.3.1.3, and 7.3.1.5, for weather forecasting and estimating impacts on electric lines and equipment, were combined when reported in the EC ARC). Energy Safety did not approve the SCE change in initiative numbering from the WMP Update to the EC ARC.

Southern California Edison, "Southern California Edison Company's 2021 Wildfire Mitigation Plan Annual Report on Compliance," Mar. 31, 2022. p.2. [Online]. Available:

<https://efiling.energysafety.ca.gov/eFiling/Getfile.aspx?fileid=52229&shareable=true>

⁴⁶ Southern California Edison, "SCE Q4 2021 QIU," February 1, 2022. [Online]

This document is located at: <https://www.sce.com/safety/wild-fire-mitigation> (see 2021 Wildfire Mitigation Plan Update & Related Documents tab, Wildfire Mitigation Plan pull down).

⁴⁷ Southern California Edison, "Southern California Edison Company's 2021 Wildfire Mitigation Plan Annual Report on Compliance (Attachment A)," Mar. 31, 2022. p. 4. [Online]. Available:

<https://efiling.energysafety.ca.gov/eFiling/Getfile.aspx?fileid=52229&shareable=true>

⁴⁸ Southern California Edison, "Southern California Edison Company's 2021 Wildfire Mitigation Plan Annual Report on Compliance (Attachment A)," Mar. 31, 2022. p. 6. [Online]. Available:

<https://efiling.energysafety.ca.gov/eFiling/Getfile.aspx?fileid=52229&shareable=true>

- Remediation mobile software and iPad devices deployment was delayed due to technology and resource issues.⁴⁹
- 4. Expanded Pole Brushing (7.3.5.5.1):
 - a. SCE completed brushing of 163,100 of 200,000 poles (81.6% of target).
- 5. Vegetation Management (VM) Work Management Tool (7.3.5.19):
 - a. SCE did not meet its target due to mobile product data volume limitations during the pilot. SCE indicated that the need to calculate and assess risk scores required additional development time, moving the timeline to 2022. More specifically:
 - The Arbora project had a projected Hazard Tree Management Program (HTMP)/Drought Relief Initiative (DRI) deployment delivery date of Q4 2021 which was delayed due to failed user acceptance testing and SCE finding approximately 40 defects to fix.
 - Offline syncing issues and data volume constraints caused delays (e.g., vendor's inability to send data for offline use and editing).⁵⁰
- 6. Customer Care Programs (7.3.6.5.2):
 - a. SCE reported the following:
 - Community Resiliency Programs – SCE only obtained four out of five customer agreements.⁵¹
 - Microgrid Islanding – SCE did not complete the installation due to global supply chain constraints.⁵²

⁴⁹ Southern California Edison, "Southern California Edison Company's 2021 Wildfire Mitigation Plan Annual Report on Compliance (Attachment A)," Mar. 31, 2022. p. 7. [Online]. Available:

<https://efiling.energysafety.ca.gov/eFiling/Getfile.aspx?fileid=52229&shareable=true>

⁵⁰ Southern California Edison, "Southern California Edison Company's 2021 Wildfire Mitigation Plan Annual Report on Compliance (Attachment A)," Mar. 31, 2022. p. 8. [Online]. Available:

<https://efiling.energysafety.ca.gov/eFiling/Getfile.aspx?fileid=52229&shareable=true>

⁵¹ Southern California Edison, "Southern California Edison Company's 2021 Wildfire Mitigation Plan Annual Report on Compliance (Attachment A)," Mar. 31, 2022. p. 17. [Online]. Available:

<https://efiling.energysafety.ca.gov/eFiling/Getfile.aspx?fileid=52229&shareable=true>

⁵² Southern California Edison, "Southern California Edison Company's 2021 Wildfire Mitigation Plan Annual Report on Compliance (Attachment A)," Mar. 31, 2022. p. 11. [Online]. Available:

<https://efiling.energysafety.ca.gov/eFiling/Getfile.aspx?fileid=52229&shareable=true>

In addition to the information regarding missed initiatives, SCE also reported the following:

1. Installed approximately 1,500 circuit miles of covered conductor, exceeding the WMP program target of 1,000 circuit miles.
2. Replaced approximately 12,000 wood poles with Fire Resistant Poles in SCE's HFRA.
3. Undergrounded approximately 5.8 overhead circuit miles in the HFRA, exceeding the target of four circuit miles.
4. Met distribution ground and aerial inspection targets by performing approximately 179,600 ground and approximately 180,200 aerial inspections on structures in the HFRA.
5. Met transmission inspection targets by performing approximately 20,800 ground and approximately 20,790 aerial inspections on structures in the HFRA.
6. Inspected approximately 600,000 trees adjacent to distribution lines and approximately 190,000 trees adjacent to transmission lines through its vegetation management program.
7. Made significant advancements in reducing the scope, frequency, and duration of PSPS events through grid hardening, grid protocols for de-energization and re-energization, and other factors. For example, SCE expedited the hardening of nearly 700 miles of overhead distribution lines and removed approximately 81,000 customers from PSPS scope through exceptions and switching protocols. SCE noted an approximately 45% reduction in PSPS duration as a result of 2021 PSPS mitigation measures.
8. Continued support for fire agencies' fire suppression efforts and performed additional inspections during the fire season based on emergent dry fuel accumulation and high wind conditions.
9. Used risk as an important input to help prioritize work within activities (supplemented with operational factors such as resource availability, permit requirements, environmental constraints, and bundling of work by location for efficiency in scheduling), further increasing SCE's ability to meet its risk reduction intent.⁵³

Additional information from the EC ARC is included in Appendix A and is discussed, as relevant, in the Discussion section of this report.

⁵³ Southern California Edison, "Southern California Edison Company's 2021 Wildfire Mitigation Plan Annual Report on Compliance," Mar. 31, 2022. p. 4. [Online]. Available: <https://efiling.energysafety.ca.gov/eFiling/Getfile.aspx?fileid=52229&shareable=true>

4.2 Independent Evaluator (IE) ARC

4.2.1 Overview

Each year before March 1, Energy Safety, in consultation with the Office of the State Fire Marshal, must publish a list of qualified independent evaluators.⁵⁴ The electrical corporations must each engage an independent evaluator from the list to review and assess its compliance with the respective approved WMP.⁵⁵ The independent evaluator must issue its IE ARC by July 1 of each year, covering the previous calendar year.⁵⁶ Energy Safety considered the independent evaluator's findings in this ARC. However, the independent evaluator's findings are not binding on Energy Safety's final determination of WMP compliance.⁵⁷

4.2.2 Relevant Information

SCE selected the team of NV5 and Guidehouse Inc. as the independent evaluator to assess its compliance with its 2021 WMP Update. NV5 and Guidehouse issued its IE ARC on June 30, 2022.

The IE evaluated 39 initiatives. Of those, the IE found SCE noncompliant with seven of the 39 initiatives.

Table 4 below provides a summary of the IE's findings. A finding of "Undetermined" means the IE was unable to determine whether SCE met its WMP target.

Table 4: Summary of SCE IE ARC Findings⁵⁸

Finding Category	Number of Initiatives
Compliant	31
Noncompliant	7
Undetermined	1
Total	39

⁵⁴ Public Utilities Code § 8386.3(c)(2)(A).

⁵⁵ Public Utilities Code § 8386.3(c)(2)(B).

⁵⁶ Public Utilities Code § 8386.3(c)(2)(B).

⁵⁷ Public Utilities Code § 8386.3(c)(2)(B)(ii).

⁵⁸ Guidehouse Inc., NV5, "Independent Evaluator Annual Report on Compliance (Table 1)," June 30, 2022. pp. 2-8. [Online]. Available: <https://efiling.energysafety.ca.gov/eFiling/Getfile.aspx?fileid=52690&shareable=true>

The seven initiatives with IE findings of noncompliance are provided below.

- Fire Science Enhancements (7.3.2.4)
 - IE finding: Vendor developed a climatology output containing a 40-year history of wildfires for multiple variables but was unable to complete because vendor work was reprioritized to support other emergent work.⁵⁹
 - SCE self-identified initiative as noncompliant.⁶⁰
- Automatic Reclosers (7.3.3.9)
 - IE finding: SCE installed 17 automation equipment devices during 2021 and that the 18th device was installed in 2022.⁶¹
 - SCE did not self-identify initiative as noncompliant as there is no target.⁶²
- Vertical Switches (7.3.3.17)
 - IE finding: SCE installed 16 of 20 vertical switches in 2021. Crews and material for the remaining 4 were reassigned due to storm restoration efforts.⁶³
 - SCE self-identified initiative as noncompliant.⁶⁴
- Inspection Work Management Tools (7.3.5.19)
 - IE Finding: SCE did not complete the transition of inspection processes to a single digital platform and did not meet the target to train at least 75% of inspectors. Scope Mapping Tool (SMT) did not meet target to deploy the tool to Distribution Planning and Engineering users.⁶⁵
 - SCE self-identified initiative as noncompliant.⁶⁶

⁵⁹ Guidehouse Inc., NV5, "Independent Evaluator Annual Report on Compliance (Table 1)," June 30, 2022. p. 2. [Online]. Available: <https://efiling.energysafety.ca.gov/eFiling/Getfile.aspx?fileid=52690&shareable=true>

⁶⁰ Southern California Edison, "Southern California Edison Company's 2021 Wildfire Mitigation Plan Annual Report on Compliance (Attachment A)," Mar. 31, 2022. p. 4. [Online]. Available: <https://efiling.energysafety.ca.gov/eFiling/Getfile.aspx?fileid=52229&shareable=true>

⁶¹ Guidehouse Inc., NV5, "Independent Evaluator Annual Report on Compliance (Table 1)," June 30, 2022. pp. 3, 38-39 [Online]. Available: <https://efiling.energysafety.ca.gov/eFiling/Getfile.aspx?fileid=52690&shareable=true>

⁶² Southern California Edison, "Response to 2021 WMP Final IE ARC," Aug. 15, 2022. pp. 2-3. [Online]. Available: <https://efiling.energysafety.ca.gov/eFiling/Getfile.aspx?fileid=52892&shareable=true>

⁶³ Guidehouse Inc., NV5, "Independent Evaluator Annual Report on Compliance (Table 1)," June 30, 2022. p. 3. [Online]. Available: <https://efiling.energysafety.ca.gov/eFiling/Getfile.aspx?fileid=52690&shareable=true>

⁶⁴ Southern California Edison, "Southern California Edison Company's 2021 Wildfire Mitigation Plan Annual Report on Compliance (Attachment A)," Mar. 31, 2022. p. 6. [Online]. Available: <https://efiling.energysafety.ca.gov/eFiling/Getfile.aspx?fileid=52229&shareable=true>

⁶⁵ Guidehouse Inc., NV5, "Independent Evaluator Annual Report on Compliance (Table 1)," June 30, 2022. pp. 3-4. [Online]. Available: <https://efiling.energysafety.ca.gov/eFiling/Getfile.aspx?fileid=52690&shareable=true>

⁶⁶ Southern California Edison, "Southern California Edison Company's 2021 Wildfire Mitigation Plan Annual Report on Compliance (Attachment A)," Mar. 31, 2022. p. 8. [Online]. Available: <https://efiling.energysafety.ca.gov/eFiling/Getfile.aspx?fileid=52229&shareable=true>

- Expanded Pole Brushing (7.3.5.5)
 - IE Finding: SCE cleared approximately 163,100 of 200,000 poles and fell short of meeting the target due to contractor performance, loss of crews, access constraints, and delays in obtaining environmental permitting.⁶⁷
 - SCE self-identified initiative as noncompliant.⁶⁸
- VM Work Management Tool (7.3.5.19)
 - IE Finding: SCE did not meet 2021 target. SCE did complete initial discovery and design architecture for the routine line clearing portion of this activity and deployed as planned.⁶⁹
 - SCE self-identified initiative as noncompliant.⁷⁰
- Customer Care Programs (7.3.6.5.2)
 - IE Finding: SCE was not able to meet all targets set under this goal. SCE did not meet two out of five targets (Community Resiliency Programs and Installation of Microgrid Islanding) for this initiative.⁷¹
 - SCE self-identified initiative as noncompliant.⁷²

After considering SCE's response to the IE ARC, Energy Safety agrees with six of the seven IE findings of noncompliance. Those include:

- Fire Science Enhancements (7.3.2.4.4)
- Vertical Switches (7.3.3.17.1)
- Inspection Work Management Tools (7.3.4.3.1)
- Expanded Pole Brushing (7.3.5.5.1)
- VM Work Management Tool (7.3.5.19)
- Customer Care Program (7.3.6.5.2))

⁶⁷ Guidehouse Inc., NV5, "Independent Evaluator Annual Report on Compliance (Table 1)," June 30, 2022. p. 8. [Online]. Available: <https://efiling.energysafety.ca.gov/eFiling/Getfile.aspx?fileid=52690&shareable=true>

⁶⁸ Southern California Edison, "Southern California Edison Company's 2021 Wildfire Mitigation Plan Annual Report on Compliance (Attachment A)," Mar. 31, 2022. p. 8. [Online]. Available: <https://efiling.energysafety.ca.gov/eFiling/Getfile.aspx?fileid=52229&shareable=true>

⁶⁹ Guidehouse Inc., NV5, "Independent Evaluator Annual Report on Compliance (Table 1)," June 30, 2022. p. 4. [Online]. Available: <https://efiling.energysafety.ca.gov/eFiling/Getfile.aspx?fileid=52690&shareable=true>

⁷⁰ Southern California Edison, "Southern California Edison Company's 2021 Wildfire Mitigation Plan Annual Report on Compliance (Attachment A)," Mar. 31, 2022. p. 8. [Online]. Available: <https://efiling.energysafety.ca.gov/eFiling/Getfile.aspx?fileid=52229&shareable=true>

⁷¹ Guidehouse Inc., NV5, "Independent Evaluator Annual Report on Compliance (Table 1)," June 30, 2022. pp. 4-5. (Table 20) p. 53. [Online]. Available:

<https://efiling.energysafety.ca.gov/eFiling/Getfile.aspx?fileid=52690&shareable=true>

⁷² Southern California Edison, "Southern California Edison Company's 2021 Wildfire Mitigation Plan Annual Report on Compliance (Attachment A)," Mar. 31, 2022. p. 11. [Online]. Available: <https://efiling.energysafety.ca.gov/eFiling/Getfile.aspx?fileid=52229&shareable=true>

Additional information from the IE ARC is discussed, as relevant, in the Discussion section of this report.

4.3 Inspections

4.3.1 Overview

Pursuant to Public Utilities Code section 326(a)(3), Energy Safety conducts field inspections of each electrical corporation's infrastructure to ensure WMP compliance. In 2021, Energy Safety conducted field inspections of each electrical corporation's infrastructure to validate WMP compliance and assess infrastructure for deficiencies, errors, or conditions with the potential to increase ignition risk.

In November 2021, Energy Safety transitioned from Inspection Program v1 to Inspection Program v2. Inspections conducted in 2021 under Inspection Program v1 were general inspections of the electrical corporation's infrastructure including WMP initiatives and general wildfire safety. During Inspection Program v1, all findings were issued to the electrical corporations as defects. Inspections conducted under Inspection Program v2 were comprised of two types of inspections: WMP inspections and General Wildfire Safety (GWS) inspections. WMP inspections are specific to WMP initiative completeness and utilize information contained in the electrical corporations' quarterly data report (QDR) submissions. During WMP inspections, Energy Safety ensures that the data reported by the electrical corporation is accurate, that the electrical corporation completed the initiative activity as reported, and that the electrical corporation adhered to the applicable initiative protocols and procedures. If Energy Safety finds inaccurate data, incomplete work, or that the electrical corporation failed to adhere to protocols or procedures, it issues a Notice of Violation (NOV) to the electrical corporation.

GWS inspections assess electrical corporation infrastructure for deficiencies, errors, or conditions with the potential to increase ignition risk. If Energy Safety finds a deficiency, error, or condition with the potential to increase the risk of ignition, a Notice of Defect (NOD)⁷³ is issued. An NOD is defined as "A deficiency, error, or condition increasing the risk of ignition posed by electrical lines and equipment."

4.3.2 Relevant Information

Energy Safety performs inspections utilizing an electrical corporation's initiative activity data applicable to the WMP year compliance period. Energy Safety conducted 9,729 inspection activities in SCE's service territory in 2021.

⁷³ California Government Code § 15475.2.

⁷⁴ California Code of Regulations § 29302(b)(1).

Under Inspection Program v1, defects found during Energy Safety's inspections included insufficient vegetation radial clearance, vegetation touching the guy wire above the insulator, and cases where pole numbers provided by SCE differed from field observations. SCE timely corrected the defects identified by Energy Safety.

Under Inspection Program v2, the defects and violations found during Energy Safety's inspections related to Data Accuracy, as work reported as completed in SCE's QDR was not completed for Covered Conductor installations and Long Span Remediation. There were also cases where Energy Safety found that SCE failed to follow its protocols when installing covered conductor. Energy Safety also found instances of insufficient vegetation radial clearance and vegetation touching the guy wire above the insulator.

During initial 2021 WMP inspections of covered conductor installations, Energy Safety identified and issued NOVs for several locations where covered conductor was reported as completed but was not. SCE responded to these findings stating, "covered conductor data discrepancies were due primarily to an issue identified when translating covered conductor point spatial data, which is how SCE tracks and records its work, to line spatial data, which is how Energy Safety requests this information. Accordingly, the 2021-Q1 and 2021-Q2 quarterly data reports (QDRs) submitted by SCE did not accurately reflect where SCE has actually installed covered conductor."⁷⁵

To remedy this, "on March 14, 2022, SCE submitted 2021 covered conductor point data to Energy Safety with four layers, one for each quarter, to ensure Energy Safety has data that is representative of SCE's best records for where and when covered conductor is installed in the field. SCE will review/evaluate its QC process before submitting future QDRs. SCE will also work to improve the accuracy of translating its point data to line data and in the interim will continue providing the covered conductor point data to Energy Safety."⁷⁶

Energy Safety accepted this response and SCE's updated QDR and closed the Violations issued. Since SCE promptly resolved this issue, Energy Safety was able to continue inspections on SCE completed 2021 WMP initiatives with negligible interruption.

⁷⁵ Southern California Edison, "Southern California Edison Company's Response to Notice of Violation - SCE ATJ 20211207-01 (No Written Hearing Requested)," Mar. 28, 2022. p. 4. [Online]. Available: <https://efiling.energysafety.ca.gov/eFiling/Getfile.aspx?fileid=52218&shareable=true>

⁷⁶ Southern California Edison, "Southern California Edison Company's Response to Notice of Violation - SCE ATJ 20211207-01 (No Written Hearing Requested)," Mar. 28, 2022. p. 4. [Online]. Available: <https://efiling.energysafety.ca.gov/eFiling/Getfile.aspx?fileid=52218&shareable=true>

4.4 Audits

4.4.1 Overview

Public Utilities Code section 8386.3(c)(5) requires Energy Safety to perform an audit to determine whether the electrical corporation "substantially complied with the substantial portion"⁷⁷ of its vegetation management requirements in its WMP. Energy Safety refers to this audit as the Substantial Vegetation Management (SVM) audit. Pursuant to Public Utilities Code section 8386(c)(5), Energy Safety conducted an audit of SCE's compliance with the vegetation management requirements in its 2021 WMP Update.

4.4.2 Relevant Information

On September 29, 2023, Energy Safety issued its SVM Audit for SCE.⁷⁸ The purpose of the SVM Audit is to assess whether SCE met its quantitative commitments and verifiable statements in its 2021 WMP Update related to vegetation management activities.

In the SVM Audit, Energy Safety found five instances where SCE did not perform all required work and required SCE to provide a response in its Corrective Action Plan.

After reviewing SCE's Corrective Action Plan, on February 2, 2024, Energy Safety issued its SVM Audit Report finding that SCE sufficiently addressed the Corrective Actions and substantially complied with the substantial portion of the vegetation management requirements in its 2021 WMP Update.⁷⁹

The specific findings from Energy Safety's SVM Audit Report are detailed in Appendix B.

⁷⁷ Public Utilities Code § 8386.3(c)(5)(C).

⁷⁸ Office of Energy Infrastructure Safety, "2021 Substantial Vegetation Management Audit Southern California Edison Company," Sept. 29, 2023. [Online]. Available:

<https://efiling.energysafety.ca.gov/eFiling/Getfile.aspx?fileid=55743&shareable=true>

⁷⁹ 2021 Report on 2021 SVM Audit of SCE is published on Energy Safety's e-filing system in the 2021 WMP Substantial Vegetation Management Audit docket and available here:

Office of Energy Infrastructure Safety, "Office of Energy Infrastructure Safety's Report on Southern California Edison's 2021 Substantial Vegetation Management Audit," Feb. 2, 2024. [Online]. Available:

<https://efiling.energysafety.ca.gov/eFiling/Getfile.aspx?fileid=56264&shareable=true>.

4.5 Data

4.5.1 Overview

Energy Safety analyzed performance metrics and other data when assessing whether the electrical corporation complied with its 2021 WMP Update.^{80, 81} Energy Safety required each electrical corporation to submit spatial and non-spatial data through QIUs, QDRs, and Quarterly Notifications (QNs).

4.5.2 Relevant Information

Energy Safety analyzed whether SCE met its 2021 WMP quantitative and qualitative initiative targets and analyzed performance of SCE's infrastructure relative to certain ignition risk and outcome metrics.

Energy Safety's Initiative Performance Analysis is detailed in Appendix C.

Energy Safety's Ignition Risk and Outcomes Metrics Analysis is detailed in Appendix D.

Findings from those analyses are included, as relevant, in the Discussion section of this report.

4.6 Third-Party Reports

4.6.1 Overview

When available, Energy Safety also utilizes authoritative, third-party reports to inform its compliance assessment. For example, Energy Safety may utilize CPUC or CAL FIRE wildfire investigation reports, CAL FIRE Wildfire Activity Statistics, and other reports to supplement and corroborate the evidence collected during its compliance assessment of the electrical corporation.

⁸⁰ California Public Utilities Commission, "Resolution M-4860," Dec. 2, 2021. [Online] Available: <https://docs.cpuc.ca.gov/PublishedDocs/Published/G000/M428/K722/428722129.PDF>

⁸¹ Office of Energy Infrastructure Safety, "Attachment 3: 2021 Wildfire Mitigation Plan Compliance Process," Oct. 13, 2021. pp. 4-5, 9. [Online]. Available: <https://energysafety.ca.gov/wp-content/uploads/docs/compliance-process/docs/compliance-process-for-2021-wmps.pdf>

5. Discussion

This section provides Energy Safety's assessment of SCE's performance in 2021 in relation to each of the evaluation criteria set forth in the Compliance Guidelines.

1. Whether the electrical corporation implemented the wildfire mitigation initiatives in its approved WMP, including evaluating whether the electrical corporation funded and performed the commitments stated for each initiative. Further, whether the electrical corporation prioritized completion of work with the highest potential for reducing wildfire risk.⁸²
2. Whether the electrical corporation achieved or sufficiently progressed its WMP objectives.
3. Wildfire risk reduction, including the performance of the electrical corporation's infrastructure relative to its wildfire risk, as measured by changes in the occurrence of events that correlate to wildfire risk.
4. Whether the electrical corporation made a good faith attempt to achieve its goals and comply with its WMP.
5. Whether the electrical corporation exhibited issues related to its execution, management, or documentation in the implementation of its WMP. This analysis may expand beyond the scope of any single WMP initiative.

5.1 Criteria 1: 2021 WMP Update Initiative Implementation

This section considers whether SCE implemented the wildfire mitigation initiatives in its approved WMP, including evaluating whether SCE funded and performed the commitments stated for each initiative.

To accomplish this, Energy Safety assessed:

1. Whether SCE met the quantitative and qualitative targets provided in its 2021 WMP Update.
2. The extent to which SCE funded each initiative.

⁸² Energy Safety evaluates funding data to ensure electrical corporations are dedicating resources to their initiative commitments. Energy Safety does not evaluate whether the cost of implementing each electrical corporation's plan was just and reasonable.

5.1.1 Completion of 2021 WMP Quantitative and Qualitative Targets

Based on Energy Safety's analysis, in conjunction with the department's review of the EC ARC and IE ARC, Energy Safety finds that SCE met or exceeded the targets of 32 of its 39 (or 82%) 2021 WMP Update initiatives. Of those, SCE met 76% of its qualitative initiatives targets and 87% of its quantitative initiative targets.⁸³

Appendix C provides detail at the initiative level on Energy Safety's comprehensive assessment of SCE's performance against its stated initiatives.

The following are the three quantitative initiatives for which SCE did not meet its targets:

1. Vertical Switches (7.3.3.17.3):
 - Completed 16 of 20 vertical switches (80% of target).
2. Expanded Pole Brushing (7.3.5.5.1):
 - Completed 163,100 of 200,000 poles brushed (81.6% of target).
3. Hazard Tree Management Program (7.3.5.16.1):
 - 131,300 of 150,000 tree assessments (87.6% of target)

The following are the four qualitative initiatives for which SCE did not meet its targets:

4. Fire Science Enhancements (7.3.2.4.4):
 - SCE's vendor developed a climatology output with a 40-year history of wildfires (including multiple variables), but did not complete the work because the vendor's work was reprioritized and shifted to support other emergent work (i.e., initiatives mitigation PSPS risk).
5. Inspection Work Management Tools (7.3.4.3.1):
 - SCE missed several targets within the initiative:
 - Scope Mapping Tool - SCE did not deploy the tool to distribution planning and engineering users.
 - Remediation mobile software and iPad devices were deployed for transmission, however the target was not met for distribution users.
 - Transmission Ground implementation and training experienced delays due to offline syncing issues and data volume constraints.
 - Scope Mapping Tool implementation experienced delays due to technical issues between the planned tool and existing datasets.

⁸³ Energy Safety noted some minor discrepancies in the actual initiative target data reported in the EC ARC, QN and QIU.

- Remediation mobile software and iPad devices deployment experienced delays due to technology and resource issues.
6. VM Work Management Tool (7.3.5.19, VM-6):
- SCE did not meet its target due to mobile product data volume limitations during the pilot. The need to calculate and assess risk scores required additional development time, moving the timeline to 2022. More specifically:
 - The Arbora project had a projected Hazard Tree Management Program/Drought Relief Initiative deployment delivery date of Q4 2021, which was delayed due to failed user acceptance testing and defects.
 - Offline syncing issues and data volume constraints caused delays.
7. Customer Care Programs (7.3.6.5.2, PSPS-2):
- SCE missed the following targets:
 - 2b) Community Resiliency Programs - SCE only obtained 4 out of 5 customer agreements.
 - 2d) Microgrid Islanding - SCE did not complete installation due to global supply chain constraints.

SCE met or exceeded the targets for 82% of its 2021 WMP Update initiatives. Of those missed, in general, the margins of the misses were small and attributable to such factors as reassigned crews during storm restoration efforts, redirecting resources to emergent work, contractor performance, access constraints, and delays in obtaining environmental permitting. Some of the work was completed in early 2022 (e.g., vertical switch installation).

SCE's missed targets, or the impacts of the failure to meet the targets, did not substantially hinder SCE's ability to complete its WMP initiatives. SCE exceeded its target to install at least 1,000 circuit miles of covered conductor, which was a primary wildfire mitigation initiative as evidenced by SCE allocating more than 46% of its 2021 WMP budget to this initiative.

Therefore, Energy Safety finds that SCE completed the significant majority of its 2021 WMP initiatives.

5.1.2 2021 WMP Update Initiative Funding

Energy Safety evaluated the extent to which SCE funded its initiative targets in its 2021 WMP Update, utilizing data from SCE's EC ARC and IE ARC.

Each EC ARC includes descriptions of all planned WMP initiative expenditure versus actual WMP initiative expenditure and an explanation of any differentials between the planned and actual expenditure.⁸⁴

SCE's planned expenditure for 2021 was approximately \$1.7 billion. SCE's actual reported expenditure was approximately \$1.654 billion, which was approximately \$45.5 million less than projected.

Within the overall lower expenditure relative to projection, SCE had some initiatives for which it met its targets but expended more or less than projected, and some initiatives for which it met its targets but expended more or less than projected. It had only one initiative that went unfunded, however, this was due to procurement contract delays with the vendor (Grid Topology Improvements to Mitigate Risk of Ignition in HFTDs (7.3.3.8.1)).

SCE had two initiatives with lower expenditures than projected, for which it also reached its targets: Other Discretionary Inspection of Distribution Electric Lines and Equipment, Beyond Inspections Mandated by Rules and Regulations (7.3.4.9.1) and Removal and Remediation of Trees with Strike Potential to Electric Lines and Equipment (7.3.5.16.1).

SCE also had three initiatives where its expenditures were lower than projected but SCE did not meet its targets: Vertical Switches (7.3.3.17.3), Forecast of a Fire Risk, Fire Potential Index or Similar (7.3.2.4.4), and Vegetation Inventory System (7.3.5.19). These targets, however, made up just a small portion (\$15.8 million), or less than 1%, of SCE's overall planned expenditures for 2021.

There were also initiatives for which SCE's expenditures exceeded its planned expenditures. For example: Vegetation Management to Achieve Clearances Around Electric Lines and Equipment (7.3.5.20), where SCE exceeded the planned expenditure amount by \$93.6 million (78% higher). SCE reported that this higher expenditure was due to the extent of HFTD work where it incurred premium time costs, including use of 6/10 scheduled work weeks in order to complete critical planned work, and also because of higher Palm skirting costs.^{85,86}

In terms of significance of completed initiatives relative to expenditure, SCE completed targets for seven of the top 10 expenditure initiatives.⁸⁷ Further, when assessing the significance of the missed targets, the seven missed targets totaled approximately 11% of the overall 2021 planned expenditure.

⁸⁴ California Public Utilities Commission, "Compliance Operational Protocols", Feb. 16, 2021. p. 10-12. [Online]. Available: <https://energysafety.ca.gov/wp-content/uploads/docs/misc/wsd/2021.02.16-compliance-operational-protocols.pdf>.

⁸⁵ 6/10 represents 6 consecutive 10-hour workdays.

⁸⁶ Southern California Edison, "Southern California Edison Company's 2021 Wildfire Mitigation Plan Annual Report on Compliance (Attachment B)," Mar. 31, 2022. p.3. [Online]. Available: <https://efiling.energysafety.ca.gov/eFiling/Getfile.aspx?fileid=52229&shareable=true>

⁸⁷ These 7 of 10 initiatives represented \$1.356M of the \$1.516M in top ten planned spending (89%).

5.2 Criteria 2: 2021 WMP Update Objectives

This section considers whether SCE achieved or sufficiently progressed its 2021 WMP objectives.

SCE's specific objective for its 2021 WMP year (i.e., Before the next Annual WMP Update) was:

- Executing current WMP activities to develop capabilities, significantly harden the system, and reduce PSPS usage and impacts. This includes completion of all program targets and attainment of near-term wildfire strategy category goals.⁸⁸

Energy Safety finds that SCE generally met its 2021 WMP year objective. SCE executed its WMP activities and conducted 150% of its grid hardening work (covered conductor), and reduced PSPS impacts. Energy Safety notes that SCE met or exceeded the targets for 82% of its 2021 WMP Update initiatives.

5.3 Criteria 3: Wildfire Risk Reduction and Performance

This section considers the performance of SCE's infrastructure relative to its wildfire risk, as measured by changes in the occurrence of events that correlate to wildfire risk.

To accomplish this, Energy Safety:

- Performed a trend and year-over-year analysis on Ignition Risk Metrics.
- Performed a trend and year-over-year analysis on Outcome Metrics.

5.3.1 Ignition Risk Metric Analysis

Ignition data analysis can provide the most direct measure of electrical corporation wildfire risk for a given year. Other metrics, such as wire down events and unplanned outages, can be instructive as well, as they correlate with wildfire risk because some portion of these events will result in ignitions.

Energy Safety conducted a detailed analysis of SCE's performance relative to these metrics over the 2015 to 2021 time horizon. That analysis is available in Appendix D. The most salient takeaways from that analysis are provided below.

⁸⁸ Southern California Edison, "2021 Wildfire Mitigation Plan Update (Revision)," June 3, 2021. p. 104. [Online]. Available: <https://www.sce.com/sites/default/files/AEM/Wildfire%20Mitigation%20Plan/2021/SCE%202021%20WMP%20Update%20Revision%20-%20CLEAN.pdf>

SCE had more total ignitions on its system in 2021 compared to both 2020 and to the six-year average from 2015-2020. 2021 also represented a relatively similar year in terms of number of days with higher risk of fire danger when compared to recent years.

Energy Safety normalizes ignitions by Red Flag Warning Overhead Circuit Mile Days (RFWOCMD) to depict wildfire risk normalized for the size of fire weather events in an electrical corporation's service territory. Use of this metric allows for comparisons across electrical corporations and enables assessment of performance in 2021 relative to trends from 2015 to 2020.

When considering the number of ignitions relative to Red Flag Warning days in 2021, SCE had a higher rate of ignitions overall in 2021 compared to 2020. It had a higher rate of ignitions in non-HFTD and Tier 2 HFTD compared to 2020 but a lower rate of ignitions in Tier 3 HFTD compared to 2020. SCE also had more total ignitions on its system in 2021 compared to both 2020 and to the six-year average from 2015-2020.

Although there was a higher rate of normalized ignitions in 2021 compared to the average, it is important to also analyze the consequence of those ignitions. In 2021, SCE ignitions resulted in relatively minor overall outcomes. SCE reported reductions in acreage burned, from 129,312 acres in 2020 down to 596 acres in 2021 and there were no structures damaged or fatalities.

In terms of drivers of the ignitions, SCE saw decreases in contact from objects and increases in equipment/facility failure ignitions as compared to the six-year average. SCE also had an increase in normalized vegetation contact ignitions compared to the six-year average.

Looking at other metrics that also correlate with risk, in 2021, SCE's normalized wire down events, unplanned outages, and vegetation-caused outages increased slightly from 2020 across SCE's distribution system. For its transmission system, there was an increase in normalized outages, but wire down events and vegetation-caused outages remained at the same levels as 2020.

Regarding PSPS risk, the normalized scope of PPS events decreased from 2020 to 2021. PPS non-normalized data show declines in PPS events (10 to 8) and that PPS events also were shorter, impacted fewer customers, and had decreased impacts on critical infrastructure.

5.3.2 Outcome Metric Analysis

As discussed above, while normalized utility-caused ignition levels increased in 2021, there were limited adverse consequences from those ignitions. There were no injuries or fatalities in 2021. Acreage burned declined from 129,312 in 2020 to 596, and there were no structures damaged or destroyed in 2021.

5.3.3 Discussion

Taken together, the variation in results across the metrics above demonstrates the nuances and complexities attached to the exercise of analyzing an electrical corporation's success at reducing risk on its system in a given year. While overall total and normalized ignitions increased in 2021, the consequences of those ignitions in terms of acres burned and structures and lives impacted were minimal to none. In light of the expected climate change-driven extreme weather events, and likely year to year fluctuations, the increase in ignitions observed in SCE's territory underscores the importance of effective and timely wildfire mitigation planning and execution.

Energy Safety will continue to monitor ignitions and wildfire consequence over the course of the 2020-2022 WMP cycle compliance reviews.

5.4 Criteria 4: Satisfaction of 2021 WMP Update Goals

This section considers whether SCE made a good faith attempt to achieve its goals and comply with its WMP.

The goal of the WMP is to reduce the risk of catastrophic wildfires caused by utility infrastructure. Based on a review of the evidence presented in this ARC, Energy Safety finds that SCE made a good faith effort to comply with its WMP.

SCE was largely successful in achieving its initiatives, having met or exceeded 32 of its 39 initiative targets (82%). These initiatives, when taken together, are intended to have the effect of lowering the risk of utility-caused ignitions. SCE's seven missed targets, and the impacts of those missed targets, did not substantially hinder SCE's ability to meet its overarching objective of mitigating the risk of wildfires caused by utility equipment. As discussed above, in terms of significance of completed initiatives relative to expenditure, SCE completed targets for seven of the top 10 expenditure initiatives, with seven missed targets representing approximately 11% of the overall 2021 planned expenditure.

Overall total ignitions and normalized ignitions increased relative to 2021 and the six-year average. Contributing to this increase was an increase in equipment/facility failure ignitions in Tier 3 and Tier 2 HFTDs compared to the six-year average from 2015 through 2020. Although ignitions increased, impacts from ignitions decreased in 2021, with lower overall average acreage burned, no fatalities/injuries, and limited structure damage.

5.5 Criteria 5: Execution, Management, and Documentation

This section considers whether SCE exhibited issues related to its execution, management, or documentation in the implementation of its WMP.

To accomplish this, Energy Safety undertook a holistic evaluation of all relevant information sources and assessments, including field verifications, for any systemic failings that may have hindered SCE's ability to reduce the risk of igniting a catastrophic wildfire. Such failings could contribute to increased risk on the system even if WMP targets are achieved.

Energy Safety identified some data consistency issues across SCE's reporting documents related to reporting its 2021 planned expenditure amounts and the quantity of 2021 initiatives it completed. Consistency and clarity of information is vital to ensuring that wildfire mitigation efforts can be effectively implemented and that Energy Safety and stakeholders have a clear understanding of SCE's plans, commitments, and progress. Energy Safety cannot overemphasize the importance of accurate recordkeeping and data management to achieving wildfire risk reduction.

6. Conclusion

Overall, SCE had positive outcomes related to implementation of its 2021 WMP. It met its targets for 32 of its 39 (or 82%) 2021 WMP Update initiatives, including seven out of the top 10 initiatives with the largest allocated expenditure.

While SCE did not meet all targets for its WMP initiatives, the failure to meet certain targets did not materially hinder SCE's ability to mitigate its wildfire risk.

Overall total ignitions and normalized ignitions increased relative to 2021 and the six-year average. Contributing to this increase was an increase in equipment/facility failure ignitions in Tier 3 and Tier 2 HFTDs compared to the six-year average from 2015 through 2020. Although there was a higher rate of ignitions, the consequence of those ignitions resulted in relatively minor outcomes. During 2021, SCE reported lower overall average acreage burned, no fatalities/injuries, and no structures damaged.

SCE was also successful in reducing the scope, frequency, duration, and customers impacted by PSPS events in 2021 compared to 2020, though it still had a total PSPS duration of over 3.7 million customer hours and eight PSPS events.

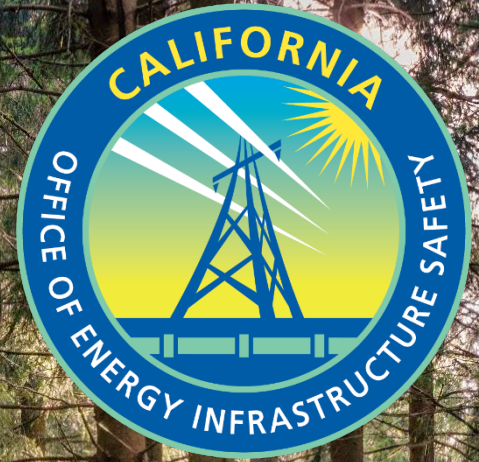
Additionally, SCE reported it installed 1,500 circuit miles of covered conductor (500 more than the target of 1,000 circuit miles) and 5.8 miles of strategic undergrounding (1.8 miles more than the target of 4 miles). SCE also replaced approximately 12,000 wood poles with Fire Resistant Poles in its High Fire Risk Area.

Energy Safety acknowledges that SCE undertook significant efforts to reduce its wildfire risk, and in many instances, SCE achieved its objectives and targets. On balance, SCE was largely successful in executing an actionable and adaptive plan for wildfire risk mitigation. There are, however, still areas for improvement and continued learning, including ensuring it is consistent in its documentation and reporting of compliance with its WMP.

Energy Safety will continue to monitor SCE's implementation of its ongoing wildfire mitigation activities and push SCE to improve its ability to ultimately achieve the elimination of utility-caused catastrophic wildfires in California.

DATA DRIVEN
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APPENDICES

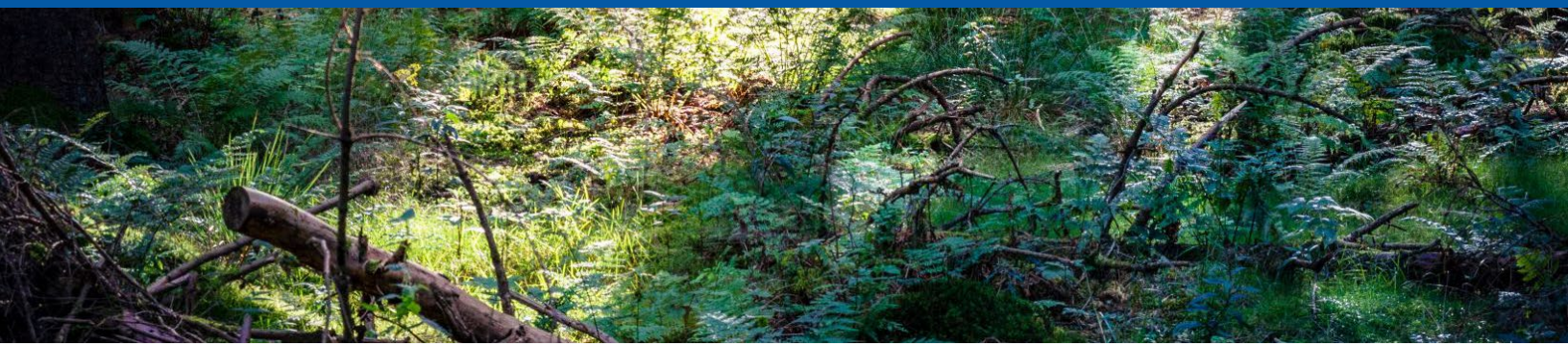


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1. Appendix A

1.1 Electrical Corporation (EC) ARC

SCE timely submitted its EC ARC on March 31, 2022. In its EC ARC, SCE reported that it did not meet targets for six of its 39 initiatives.^{1,2}

1.1.1 Achievement of Risk Reduction

The six initiatives with missed targets were:

1. Fire Science Enhancements (7.3.2.4.4):
 - a. SCE's vendor developed a climatology output with a 40-year history of wildfires (including multiple variables), but did not complete the work because the vendor's work was reprioritized and shifted to support other emergent work (i.e., initiatives mitigating PSPS risk).³
2. Vertical Switches (7.3.3.17.3):
 - a. SCE installed 16 of 20 vertical switches (80% of target).⁴
3. Inspection Work Management Tools (7.3.4.3.1):
 - a. SCE missed several targets within the initiative including:
 - o Scope Mapping Tool - SCE did not meet the target to deploy the tool to Distribution Planning and Engineering users and implementation was delayed due to technical issues between the planned tool and existing datasets.

¹ The 39 initiatives discussed in SCE's EC ARC is different from the 47 initiatives reported in its 2021 WMP Update (Table 1 above). SCE combined some of the initiatives identified into one initiative for purposes of reporting for the EC ARC (e.g., WMP initiatives 7.3.2.6.1, 7.3.1.1, 7.3.1.3, and 7.3.1.5, for weather forecasting and estimating impacts on electric lines and equipment, were combined when reported in the EC ARC). Energy Safety did not approve the SCE change in initiative numbering from the WMP Update to the EC ARC.

Southern California Edison, "Southern California Edison Company's 2021 Wildfire Mitigation Plan Annual Report on Compliance," Mar. 31, 2022, p.2. [Online]. Available:

<https://efiling.energysafety.ca.gov/eFiling/Getfile.aspx?fileid=52229&shareable=true>

² Southern California Edison, "SCE Q4 2021 QIU," February 1, 2022. [Online]

This document is located at: <https://www.sce.com/safety/wild-fire-mitigation> (see 2021 Wildfire Mitigation Plan Update & Related Documents tab, Wildfire Mitigation Plan pull down).

³ Southern California Edison, "Southern California Edison Company's 2021 Wildfire Mitigation Plan Annual Report on Compliance (Attachment A)," Mar. 31, 2022. p. 4. [Online]. Available:

<https://efiling.energysafety.ca.gov/eFiling/Getfile.aspx?fileid=52229&shareable=true>

⁴ Southern California Edison, "Southern California Edison Company's 2021 Wildfire Mitigation Plan Annual Report on Compliance (Attachment A)," Mar. 31, 2022. p. 6. [Online]. Available:

<https://efiling.energysafety.ca.gov/eFiling/Getfile.aspx?fileid=52229&shareable=true>

- SCE deployed remediation mobile software and iPad devices to transmission users, but not distribution users.
 - Transmission Ground implementation and training was delayed due to offline syncing issues and data volume constraints.
 - Remediation mobile software and iPad devices deployment was delayed due to technology and resource issues.⁵
4. Expanded Pole Brushing (7.3.5.5.1):
- a. SCE completed brushing of 163,100 of 200,000 poles (81.6% of target).
5. Vegetation Management (VM) Work Management Tool (7.3.5.19):
- a. SCE did not meet its target due to mobile product data volume limitations during the pilot. SCE indicated that the need to calculate and assess risk scores required additional development time, moving the timeline to 2022. More specifically:
 - The Arbora project had a projected Hazard Tree Management Program (HTMP)/Drought Relief Initiative (DRI) deployment delivery date of Q4 2021 which was delayed due to failed user acceptance testing and SCE finding approximately 40 defects to fix.
 - Offline syncing issues and data volume constraints caused delays (e.g., vendor's inability to send data for offline use and editing).⁶
6. Customer Care Programs (7.3.6.5.2):
- a. SCE reported the following:
 - Community Resiliency Programs – SCE only obtained four out of five customer agreements.⁷
 - Microgrid Islanding – SCE did not complete the installation due to global supply chain constraints.⁸

⁵ Southern California Edison, "Southern California Edison Company's 2021 Wildfire Mitigation Plan Annual Report on Compliance (Attachment A)," Mar. 31, 2022. p. 7. [Online]. Available:

<https://efiling.energysafety.ca.gov/eFiling/Getfile.aspx?fileid=52229&shareable=true>

⁶ Southern California Edison, "Southern California Edison Company's 2021 Wildfire Mitigation Plan Annual Report on Compliance (Attachment A)," Mar. 31, 2022. p. 8. [Online]. Available:

<https://efiling.energysafety.ca.gov/eFiling/Getfile.aspx?fileid=52229&shareable=true>

⁷ Southern California Edison, "Southern California Edison Company's 2021 Wildfire Mitigation Plan Annual Report on Compliance (Attachment A)," Mar. 31, 2022. p. 17. [Online]. Available:

<https://efiling.energysafety.ca.gov/eFiling/Getfile.aspx?fileid=52229&shareable=true>

⁸ Southern California Edison, "Southern California Edison Company's 2021 Wildfire Mitigation Plan Annual Report on Compliance (Attachment A)," Mar. 31, 2022. p. 11. [Online]. Available:

<https://efiling.energysafety.ca.gov/eFiling/Getfile.aspx?fileid=52229&shareable=true>

In addition to the information regarding missed initiatives, SCE also reported the following:

1. Installed approximately 1,500 circuit miles of covered conductor, exceeding the WMP program target of 1,000 circuit miles.
2. Replaced approximately 12,000 wood poles with Fire Resistant Poles in SCE's HFRA.
3. Undergrounded approximately 5.8 overhead circuit miles in the HFRA, exceeding the target of four circuit miles.
4. Met distribution ground and aerial inspection targets by performing approximately 179,600 ground and approximately 180,200 aerial inspections on structures in the HFRA.
5. Met transmission inspection targets by performing approximately 20,800 ground and approximately 20,790 aerial inspections on structures in the HFRA.
6. Inspected approximately 600,000 trees adjacent to distribution lines and approximately 190,000 trees adjacent to transmission lines through its vegetation management program.
7. Made significant advancements in reducing the scope, frequency, and duration of PSPS events through grid hardening, grid protocols for de-energization and re-energization, and other factors. For example, SCE expedited the hardening of nearly 700 miles of overhead distribution lines and removed approximately 81,000 customers from PSPS scope through exceptions and switching protocols. SCE noted an approximately 45% reduction in PSPS duration as a result of 2021 PSPS mitigation measures.
8. Continued support for fire agencies' fire suppression efforts and performed additional inspections during the fire season based on emergent dry fuel accumulation and high wind conditions.
9. Used risk as an important input to help prioritize work within activities (supplemented with operational factors such as resource availability, permit requirements, environmental constraints, and bundling of work by location for efficiency in scheduling), further increasing SCE's ability to meet its risk reduction intent.⁹

⁹ Southern California Edison, "Southern California Edison Company's 2021 Wildfire Mitigation Plan Annual Report on Compliance," Mar. 31, 2022. p. 4. [Online]. Available: <https://efiling.energysafety.ca.gov/eFiling/Getfile.aspx?fileid=52229&shareable=true>

1.1.2 Planned vs Actual WMP Update Initiative Expenditures

In its EC ARC, each electrical corporation is required to provide descriptions of all WMP initiative planned expenditure versus WMP initiative actual expenditure and an explanation of any differences between the planned and actual expenditure.

SCE reported the following regarding planned vs actual WMP Update expenditure:

Table 1: SCE's Planned Versus Actual Expenditure by Year (in thousand \$s)¹⁰

Year	Planned Cost (\$K)	Actual Cost ¹¹ (\$K)	Difference (\$K)
2020	\$1,308,269	\$1,356,922	\$48,653
2021 ¹²	\$1,704,298	\$1,658,800	(\$45,498)

SCE reported it had nine initiatives where it expended more than 20% of the planned expenditure amount.¹³ For initiatives in this category, the average expenditure exceeded the planned expenditure by 91%. SCE reported it had 27 initiatives where the actual expenditure was less than the planned expenditure by 20% or more.¹⁴ For initiatives in this category, the average expenditure was 63% of planned expenditure.

¹⁰ Note that the planned cost figures for 2021 were not reported consistently by SCE (See Section 6.5). Southern California Edison, "2021 Wildfire Mitigation Plan Update (Revision) (Table 3-1)," June 3, 2021. p. 32. [Online]. Available:

<https://www.sce.com/sites/default/files/AEM/Wildfire%20Mitigation%20Plan/2021/SCE%202021%20WMP%20Update%20Revision%20-%20CLEAN.pdf>

¹¹ Southern California Edison, "2022 Wildfire Mitigation Plan Update (Table 3-1)," Feb.18, 2022. p. 26. [Online]. Available: <https://www.sce.com/sites/default/files/custom-files/SCE%202022%20WMP%20Update.pdf>

¹² Note: the planned initiative spend figure of \$1,704,298 (Table 3-1 of the SCE 2021 WMP Update) is \$74,821 more than the \$1,629,477 planned initiative spend figure noted in Table 1 of this report which was reported in Attachment B of SCE's 2021 EC ARC.

Southern California Edison, "2021 Wildfire Mitigation Plan Update (Revision) (Table 3-1)," June 3, 2021. p. 33. [Online]. Available:

<https://www.sce.com/sites/default/files/AEM/Wildfire%20Mitigation%20Plan/2021/SCE%202021%20WMP%20Update%20Revision%20-%20CLEAN.pdf>

¹³ Southern California Edison, "Southern California Edison Company's 2021 Wildfire Mitigation Plan Annual Report on Compliance (Attachment B)," Mar. 31, 2022. pp. 1-3. [Online]. Available:

<https://efiling.energysafety.ca.gov/eFiling/Getfile.aspx?fileid=52229&shareable=true>

¹⁴ Southern California Edison, "Southern California Edison Company's 2021 Wildfire Mitigation Plan Annual Report on Compliance (Attachment B)," Mar. 31, 2022. pp. 1-3. [Online]. Available:

<https://efiling.energysafety.ca.gov/eFiling/Getfile.aspx?fileid=52229&shareable=true>

SCE reported the two initiatives with expenditures that were significantly lower than planned included:

- Discretionary Inspection of Distribution Electric Lines and Equipment, Beyond Inspections Mandated by Rules and Regulations (7.3.4.9.1) - the actual expenditure amount was \$83.8 million below the planned amount of \$252M (33% lower). SCE explained that this lower expenditure was due to SCE being able to bundle distribution remediation work (remediations completed with other programs such as covered conductor for operational efficiency) and that SCE had fewer remediations to complete due to lower inspection find rates than forecasted. Both of these factors contributed to lower expenditure relative to forecast.¹⁵
- Removal and Remediation of Trees with Strike Potential to Electric Lines and Equipment (7.3.5.16.1) - the actual expenditure amount was \$48.3 million (60% lower) below the planned amount of \$81M. SCE indicated that while it completed its targets for the initiative it found fewer trees with strike potential, completed fewer assessments, and found less trees requiring mitigation.

SCE reported the two initiatives with expenditures that were significantly higher than the planned amount included:

- Vegetation Management to Achieve Clearances Around Electric lines and Equipment (7.3.5.20) – SCE exceeded the planned expenditure amount by \$93.6 million (78% higher). SCE explained this was due to the extent of HFTD work where it incurred premium time costs, including use of 6/10 (i.e., working 6 consecutive 10 hour shifts) scheduled work weeks in order to complete critical planned work, and also because of higher Palm skirting costs.¹⁶
- Covered Conductor Installation (7.3.3.3.1) – SCE exceeded the planned expenditure amount by \$144 million (19% higher). SCE reported it performed additional scope, accelerated the scope of PSPS Action Plan mitigations, and experienced increases in unit costs.¹⁷ Although SCE's expenditure exceeded the planned spend, for 2021 SCE exceeded its covered conductor target by 50% (1,500 circuit miles installed; 1,000 circuit mile target).

¹⁵ Southern California Edison, "Southern California Edison Company's 2021 Wildfire Mitigation Plan Annual Report on Compliance (Attachment B)," Mar. 31, 2022. P. 1. [Online]. Available: <https://efiling.energysafety.ca.gov/eFiling/Getfile.aspx?fileid=52229&shareable=true>

¹⁶ Southern California Edison, "Southern California Edison Company's 2021 Wildfire Mitigation Plan Annual Report on Compliance (Attachment B)," Mar. 31, 2022. P. 3. [Online]. Available: <https://efiling.energysafety.ca.gov/eFiling/Getfile.aspx?fileid=52229&shareable=true>

¹⁷ Southern California Edison, "Southern California Edison Company's 2021 Wildfire Mitigation Plan Annual Report on Compliance (Attachment B)," Mar. 31, 2022. p. 1. [Online]. Available: <https://efiling.energysafety.ca.gov/eFiling/Getfile.aspx?fileid=52229&shareable=true>

2. Appendix B

2.1 Substantial Vegetation Management Audit

On September 29, 2023, Energy Safety issued its SVM Audit for SCE.¹⁸ The purpose of the SVM Audit is to assess whether SCE met its quantitative commitments and verifiable statements in its 2021 WMP Update related to vegetation management activities. In the SVM Audit, Energy Safety found five instances where SCE did not perform all required work and required SCE to provide a response in its Corrective Action Plan.

After reviewing SCE's Corrective Action Plan, on February 2, 2024, Energy Safety issued its SVM Audit Report finding that SCE sufficiently addressed the Corrective Actions and substantially complied with the substantial portion of the vegetation management requirements in its 2021 WMP Update.¹⁹

The findings from Energy Safety's SVM Audit Report are detailed in Table 2 below.

Table 2: Energy Safety's Findings from SCE 2021 SVM Audit Report of WMP Vegetation Management Initiatives

2021 WMP Update Initiative Number	2021 WMP Update Initiative Name	Determination
7.3.5.1	Additional Efforts to Manage Community and Environmental Impacts	All work performed
7.3.5.2	Detailed Inspections of Vegetation Around Distribution Electric Lines and Equipment	All work performed

¹⁸ SCE SVM Audit is published on Energy Safety's e-filing system in the 2021 WMP Substantial Vegetation Management Audits docket and available here: Office of Energy Infrastructure Safety, "2021 Substantial Vegetation Management Audit Southern California Edison Company," Sept. 29, 2023. [Online]. Available:

<https://efiling.energysafety.ca.gov/eFiling/Getfile.aspx?fileid=55743&shareable=true>

¹⁹ 2021 Report on 2021 SVM Audit of SCE is published on Energy Safety's e-filing system in the 2021 WMP Substantial Vegetation Management Audit docket and available here:

Office of Energy Infrastructure Safety, "Office of Energy Infrastructure Safety's Report on Southern California Edison's 2021 Substantial Vegetation Management Audit," Feb. 2, 2024. [Online]. Available:

<https://efiling.energysafety.ca.gov/eFiling/Getfile.aspx?fileid=56264&shareable=true>

2021 WMP Update Initiative Number	2021 WMP Update Initiative Name	Determination
7.3.5.3	Detailed Inspections of Vegetation Around Transmission Electric Lines and Equipment	All work performed
7.3.5.4	Emergency Response Vegetation Management Due to Red Flag Warning or Other Urgent Conditions	All work performed
7.3.5.5	Fuel Management and Reduction of “Slash” from Vegetation Management Activities	Sufficient Corrective Action Response
7.3.5.6	Improvement of Inspections	All work performed
7.3.5.7	LiDAR Inspection of Vegetation Around Distribution Electric Lines and Equipment	All work performed
7.3.5.8	LiDAR Inspection for Vegetation Around Transmission Electric Lines and Equipment	Sufficient Corrective Action Response
7.3.5.9	Other Discretionary Inspections of Vegetation Around Distribution Electric Lines and Equipment, Beyond Inspections Mandated by Rules and Regulations	All work performed
7.3.5.10	Other Discretionary Inspections of Vegetation Around Transmission electric lines and equipment beyond inspections mandated by rules and regulations	All work performed
7.3.5.11	Patrol Inspections of Vegetation Around Distribution Electric Lines and Equipment	All work performed

2021 WMP Update Initiative Number	2021 WMP Update Initiative Name	Determination
7.3.5.12	Patrol Inspections of Vegetation Around Transmission electric lines and equipment	All work performed
7.3.5.13	Quality Assurance/Quality Control of Inspections	All work performed
7.3.5.14	Recruiting and Training of Vegetation Management Personnel	Sufficient Corrective Action Response
7.3.5.15	Remediation of At-Risk Species	All work performed
7.3.5.16	Removal and Remediation of Trees with Strike Potential to Electric Infrastructure (Hazard Tree Removal and Right Tree-Right Place)	Sufficient Corrective Action Response
7.3.5.17	Substation Inspections	Did not perform all work
7.3.5.18	Substation Vegetation Management	All work performed
7.3.5.19	Vegetation Inventory System	All work performed
7.3.5.20	Vegetation Management to Achieve Clearance Around Electric Lines and Equipment	All work performed

3. Appendix C

3.1 Initiative Performance

Energy Safety assessed whether SCE achieved its 2021 WMP Update qualitative and quantitative commitments through multiple analyses and information sources.

Energy Safety verified compliance with qualitative and quantitative commitments within SCE's 2021 WMP Update for its System Hardening, Asset Management and Inspections, and Vegetation Management initiatives. For each electrical corporation, the initiatives for compliance verification comprised >60% of the total WMP Update Proposed Expenditures.

Energy Safety also analyzed SCE's Q4 2021 QIU submission from March 31, 2021, SCE's EC ARC, and SCE's Q4 2021 QN to assess whether SCE achieved its 2021 WMP Update qualitative and quantitative initiative commitments.

3.1.1 2021 Quarterly Reporting Initiative Performance Analysis

In accordance with Energy Safety's 2020 Compliance Operational Protocols, SCE submitted all four of its 2021 QIUs. The QIUs contained 39 initiatives, as shown in Table 3 below.^{20, 21} Of SCE's 39 total WMP initiatives, 22 contained quantitative targets and 16 contained qualitative targets, while one had both quantitative and qualitative targets.

Table 3: SCE Number of 2021 WMP Update Initiatives with Quantitative and Qualitative Targets

SCE's 2021 WMP Update Initiatives (QIU data)	Numbers
Initiatives with Quantitative Targets	22

²⁰ The 39 initiatives discussed in SCE's EC ARC is different from the 47 initiatives reported in its 2021 WMP Update (Table 1 above). SCE combined some of the initiatives identified into one initiative for purposes of reporting for the EC ARC (e.g., WMP initiatives 7.3.2.6.1, 7.3.1.1, 7.3.1.3, and 7.3.1.5, for weather forecasting and estimating impacts on electric lines and equipment, were combined when reported in the EC ARC). Energy Safety did not approve the SCE change in initiative numbering from the WMP Update to the EC ARC.

Southern California Edison, "Southern California Edison Company's 2021 Wildfire Mitigation Plan Annual Report on Compliance," Mar. 31, 2022, p.2. [Online]. Available:

<https://efiling.energysafety.ca.gov/eFiling/Getfile.aspx?fileid=52229&shareable=true>

²¹ Southern California Edison, "SCE Q4 2021 QIU," February 1, 2022. [Online]

This document is located at: <https://www.sce.com/safety/wild-fire-mitigation> (see 2021 Wildfire Mitigation Plan Update & Related Documents tab, Wildfire Mitigation Plan pull down).

SCE's 2021 WMP Update Initiatives (QIU data)	Numbers
Initiatives with Qualitative Targets	16
Initiatives with Both Quantitative and Qualitative Targets	1
Total Initiatives	39

3.1.2 Initiative Performance Results

Results for Initiatives with Quantitative Targets

SCE either met or exceeded the targets for 20 of 23 initiatives (or 87%) with quantitative targets.²²

Table 4 summarizes the initiatives with exclusives quantitative targets. Bold values represent initiatives where the target was not met.

Of the three initiatives in which SCE failed to meet its narratives, actions, and/or targets in its WMP, its average progress was approximately 19% below its targets.

²² Quantitative target count is 23, as there were 22 initiatives with quantitative targets and one initiative with both a quantitative and a qualitative target, which results in a combine number of 23 targets.

Table 4: Initiatives with only Quantitative Targets

Initiative Number	Initiative Name	Target Units	WMP Target	Reported Actual Progress in QIU	Reported Actual Progress in QN	Reported Actual Progress in EC ARC
7.3.2.1	Advanced Weather Monitoring	Stations	375	406	400	400
7.3.2.2	Distribution Fault Application (DFA)	DFA Units on Circuits	120	130	130	130
7.3.3.2	Circuit Breaker Relay Hardware for Fast Curve	Relay Units Installed	60	95	95	95
7.3.3.3.1	Distribution OH Hardening – Covered Conductor	Miles	1,000	1,500	1,500	1,500
7.3.3.3.2	Tree Attachment Remediation	Tree Attachment Remediated	500	520	520	530
7.3.3.7.1	Branch Line Protection Strategy	Fuses Installed	330	350	350	350
7.3.3.9	Installation of System Automation Equipment - RAR / RCS	Devices Installed	N/A, TBD	23	23	18
7.3.3.12.1	Long Span Initiative	Assessments	300	360	360	360
7.3.3.15.1	C-Hooks	C-Hooks Replaced	40	50	50	50
7.3.3.16.1	Undergrounding Overhead Conductor	Circuit Miles in HFRA	4	5.8	5.8	5.8

Initiative Number	Initiative Name	Target Units	WMP Target	Reported Actual Progress in QIU	Reported Actual Progress in QN	Reported Actual Progress in EC ARC
7.3.3.17.1	Transmission Open Phase Detection	Number of Installations on Transmission Circuits	10	10	10	10
7.3.3.17.3	Vertical Switches	Number of Switches	20	16	16	16
7.3.4.4	Infrared Inspection of Energized Overhead Distribution Facilities and Equipment	Percent of Distribution Circuit Miles in HFRA	50	50	50	50
7.3.3.4.5	Infrared Inspection, Corona Scanning, and High-Definition Imagery of Energized Overhead Transmission facilities and Equipment	Number of Transmission Circuit Miles in HFRA	1,000	1,000	1,000	1,000
7.3.3.4.9.1	Distribution High Fire Risk Informed Inspections in HFRA	Number of Structures in HFRA	163,000 (ground); 163,000 (aerial)	184,900 (ground); 180,300 (aerial)	184,900	179,600 (ground); 180,200 (aerial)
7.3.4.9.2	Generation High Fire Risk Informed Inspections in HFRA	Number of Structures in HFRA	181	230	230	230

Initiative Number	Initiative Name	Target Units	WMP Target	Reported Actual Progress in QIU	Reported Actual Progress in QN	Reported Actual Progress in EC ARC
7.3.4.10.1	Transmission High Fire Risk Informed Inspections in HFRA	Number of Structures in HFRA	16,800 (ground); 16,800 (aerial)	20,800 (ground); 20,800 (aerial)	20,800 (ground); 20,800 (aerial)	20,800 (ground); 20,790 (aerial)
7.3.5.5.1	Expanded Pole Brushing	Number of Poles Cleared	200,000	163,100	163,100	163,100
7.3.5.5.2	Expanded Clearances for Legacy Facilities	Number of Sites Treated	46	60	60	60
7.3.5.16.1	Hazard Tree Management Program	Number of Trees Assessed	150,000²³	131,400	131,400	131,300
7.3.9.1	SCE Emergency Response Training	Number Trained	50	60	60	60
7.3.10.1	Customer Education and Engagement - Community Meetings	Number of Meetings	At least 9; Up to 18	11	11	11
7.3.4.10.31	Customer Education and Engagement, Marketing Campaign	Percent PSPS Awareness	50	60	60	60

²³SCE submitted a change order which requested adjusting its target of 150,000 assessed trees to between 120,000 and 130,000 trees. Energy Safety's determination was "no change necessary" because it did not meet the change order criteria: SCE's risk did not change. In Energy Safety's 2021 SVM Audit Report, Energy Safety accepted SCE's reasoning to why target was missed as the change from target did not detract from SCE's objectives or targets.

Office Energy Infrastructure Safety, "2021 Wildfire Mitigation Plan Change Order Decision" 2021. p.5. [Online]. Available:

<https://efiling.energysafety.ca.gov/eFiling/Getfile.aspx?fileid=52258&shareable=true>

Results for Initiatives with Qualitative Targets

In its 2021 Quarter 4 QIU, SCE reported that it had completed 13 of its 17 2021 WMP Update initiatives with qualitative targets, including:

- Meeting the target by producing higher resolution (1km x 1km) ensemble weather forecasts and extended PSPS forecast from 5 to 7 days (7.3.2.6.1)
- Completing its first wind profiler deployment to align the existing weather model and weather station output (7.3.2.4.3)
- Completing five Hydro Control Circuits assessments, two Low Voltage Site Hardening project plans based on 2020 engineering assessments, and 12 additional Grounding Studies/Lightning Arrestor assessments (7.3.3.17.2)
- Completing the first and second pass on approximately 1,300 circuits and performing prescribed mitigations in accordance with program guidelines and schedules (7.3.5.16.2)
- Completing Incident Management Team trainings and qualifications (7.3.9.1).

Table 5 below summarizes the four qualitative initiatives where SCE did not meet its targets.

Table 5: Initiatives with only Qualitative Targets Not Met

Initiative Number	Initiative Name	WMP Target	Reported Actual Progress in QIU	Reported Actual Progress in QN	Reported Actual Progress in EC ARC
7.3.2.4.4 (SA-8)	Fire Science Enhancements	Evaluate current wildfire events in context of 40-year history of wildfires	Did not meet target. Vendor developed a climatology output containing a 40-year history of wildfires for multiple variables but was unable to complete because vendor work was reprioritized to support other emergent work.	SCE did not meet target. Vendor developed a climatology output containing a 40-year history of wildfires for multiple variables but unable to complete because vendor work was reprioritized to support other emergent work. Due to vendor resource constraints, evaluation will take place in 2022.	Did not meet target. Vendor developed a climatology output containing a 40-year history of wildfires for multiple variables but was unable to complete because vendor work was reprioritized to support other emergent work.

Initiative Number	Initiative Name	WMP Target	Reported Actual Progress in QIU	Reported Actual Progress in QN	Reported Actual Progress in EC ARC
7.3.4.3.1 (IN-8)	Inspection Work Management Tools	Transition Aerial and Transmission ground inspection process to a single digital platform with at least 75% of inspectors trained to use the tool by year end 2021. Deploy scope mapping tool with GIS visualization to Distribution	T&D Aerial completed transition of inspection processes to a single digital platform and met target to train at least 75% of inspectors. Transmission Ground did not complete transition of inspection processes to a single digital platform and did not meet target to train at least 75% of inspectors. Key artificial intelligence/machine learning (AI/ML) models met target. Scope Mapping Tool did not meet target to deploy tool to Distribution Planning and Engineering users. Remediation mobile software and iPad devices were deployed for Transmission however target was not met for Distribution users.	SCE partially met targets. T&D Aerial completed transition of inspection processes to a single digital platform and met target to train at least 75% of inspectors. Transmission Ground did not complete transition of inspection processes to a single digital platform and did not meet target to train at least 75% of inspectors. Key artificial intelligence/machine learning (AI/ML) models met target. Scope Mapping Tool did not meet target to deploy tool to Distribution Planning and Engineering users. Remediation mobile software and iPad devices were deployed for Transmission however target was not met for Distribution users.	SCE partially met targets. T&D Aerial completed transition of inspection processes to a single digital platform and met target to train at least 75% of inspectors. Transmission Ground did not complete transition of inspection processes to a single digital platform and did not meet target to train at least 75% of inspectors by year end 2021. However, as of Q1 2022 inspectors were trained and using the tool. Key artificial intelligence/machine learning (AI/ML) models met target. Scope Mapping Tool did not meet target to deploy tool to Distribution Planning and Engineering users. Remediation mobile software and iPad devices were deployed for Transmission however target was not met for Distribution users.

Initiative Number	Initiative Name	WMP Target	Reported Actual Progress in QIU	Reported Actual Progress in QN	Reported Actual Progress in EC ARC
7.3.5.19 (VM-6)	VM Work Management Tool	Continue Work Management Tool (Arbora) agile development and releases in accordance with project plan – complete full rollout of Dead & Dying Tree Removal and Hazard Tree Mitigation, and conduct discovery and design architecture associated with Line Clearing	SCE did not meet 2021 target. SCE did complete initial discovery and design architecture for the routine Line Clearing portion of this activity and deployed as planned. However, SCE had to re-design architecture for the Hazard Tree Management Program and Dead and Dying Tree Removal due to data volume limitations and inability to calculate and assess risk scores, requiring additional development time and moving timeline to 2022.	SCE did not meet 2021 target. SCE did complete initial discovery and design architecture for the routine Line Clearing portion of this activity and deployed as planned. However, SCE had to re-design architecture for the Hazard Tree Management Program and Dead and Dying Tree Removal due to data volume limitations and inability to calculate and assess risk scores, requiring additional development time and moving timeline to 2022.	SCE did not meet 2021 target. SCE did complete initial discovery and design architecture for the routine Line Clearing portion of this activity and deployed as planned. However, SCE had to re-design architecture for the Hazard Tree Management Program and Dead and Dying Tree Removal due to data volume limitations and inability to calculate and assess risk scores, requiring additional development time. As of the end of Q1 2022, Pilot deployment of HTP was completed with full deployment of HTP will be rolled out in Q2 2022. This will be followed by Routine Line Clearing implementation by the end of 2022.

Initiative Number	Initiative Name	WMP Target	Reported Actual Progress in QIU	Reported Actual Progress in QN	Reported Actual Progress in EC ARC
<p>7.3.6.5.2 (PSPS-2)</p>	<p>Customer Care Programs</p>	<p>Community Resource Centers (CRC): Adjust as needed.</p> <p>Community Resiliency Programs: Goals for Resilience Zones dependent on community leaders identifying potential customers. Targeting to obtain 5 to 10 agreements. Complete installation of microgrid islanding (CREI) capability on second pilot customer.</p> <p>Customer Resiliency Equipment:</p> <p>Critical Care Backup Battery (CCBB): Expand program to eligible MBL customers who are enrolled in CARE/ FERA and reside HFRA. Expand marketing and outreach plans.</p> <p>Well Water & Res Battery Station Rebates: Enhance the programs to increase customer participation by 20% - 40%.</p>	<p>2a: 64 CRC sites enrolled (62 of which are indoor) as of end of 2021 based on evaluation of circuits likely to be impacted by PSPS events.</p> <p>2b: Community Resiliency Programs: SCE did not meet its 2021 target. Obtained 4 out of 5 customer agreements. This pilot will be discontinued in 2022.</p> <p>2d: Microgrid Islanding (CREI) missed its 2021 target of completing installation due to global supply chain constraints.</p> <p>2c: CCBB program: Target met by expanding CCBB program to eligible MBL and established additional partners such as community based organizations (CBOs).</p> <p>2e: Well Water & Residential Battery Station Rebate: program: Target met by increasing customer participation by 93%.</p>	<p>SCE partially met targets.</p> <p>2a: 64 CRC sites enrolled (62 of which are indoor) as of end of 2021 based one valuation of circuits likely to be impacted by PSPS events.</p> <p>2b: Community Resiliency Programs: SCE did not meet its 2021 target. Obtained 4 out of 5 customer agreements. This pilot will be discontinued in 2022.</p> <p>2d: Microgrid Islanding (CREI) missed its 2021 target of completing installation due to global supply chain constraints.</p> <p>2c: CCBB program: Target met by expanding CCBB program to eligible MBL and established additional partners (CBOs).</p> <p>2e: Well Water & Residential Battery Station Rebate: program: Target met by increasing customer participation by 93%.</p>	<p>2a: 64 CRC sites enrolled (62 of which are indoor) as of end of 2021 based one valuation of circuits likely to be impacted by PSPS events.</p> <p>2b: Community Resiliency Programs: SCE did not meet its 2021 target. Obtained 4 out of 5 customer agreements. This pilot will be discontinued in 2022 due to lack of participation.</p> <p>2d: Microgrid Islanding (CREI) missed its 2021 target of completing installation due to global supply chain constraints. Due to unforeseen delays with approvals from the school district this activity is projected to be completed by end of Q2 2022.</p> <p>2c: CCBB program: Target met by expanding CCBB program to eligible MBL and established additional partners (CBOs).</p> <p>2e: Well Water & Residential Battery Station Rebate: program: Target met by increasing customer participation by 93%.</p>

3.1.3 2021 Grid Design and System Hardening Initiatives Analysis

SCE's Grid Design and System Hardening initiatives represented 60% of SCE's total planned expenditure for its 2021 WMP Update.²⁴

Energy Safety assessed whether SCE met its quantitative and qualitative commitments in its 2021 WMP Update for its Grid Design and System Hardening (Section 7.3.3)²⁵ initiatives.

Energy Safety found that SCE met its quantitative targets and implemented its verifiable statements for 12 out of the 13 Grid Design and System Hardening initiative commitments reviewed, as detailed in Table 6 below.

Table 6: Energy Safety's Analysis of SCE's 2021 WMP Grid Design and System Hardening Initiatives

Initiative Number and Name	2021 WMP Update Quantitative Target	2021 Actual Reported	2021 WMP Update Qualitative Target	2021 Actual Reported	Method of Verification	Energy Safety Finding
7.3.3.2 - Circuit Breaker Relay Hardware for Fast Curve	Replace/upgr ade 60 relay units in HFRA	95 relay units in HFRA	N/A	N/A	QUI, AQL, EC-ARC	Commitment met
7.3.3.3.1 - Covered Conductor Installation – Covered Conductor	1,000 Miles Hardened with Covered Conductor	1,500 Miles Hardened with Covered Conductor	N/A	N/A	QUI, QAL, EC ARC	Commitment met

²⁴ Southern California Edison, "Wildfire Safety Division Attachment 2.3 Wildfire Mitigation Plan Quarterly report (Table 12)," June 3, 2021. [Online]. Available: <https://www.sce.com/sites/default/files/AEM/Wildfire%20Mitigation%20Plan/2021/SCE%20Tables%201-12%20Revision.xlsx>

²⁵ Southern California Edison, "2021 Wildfire Mitigation Plan Update (Revision)," June. 3, 2021. pp. 211-232. [Online]. Available: <https://www.sce.com/sites/default/files/AEM/Wildfire%20Mitigation%20Plan/2021/SCE%202021%20WMP%20U pdate%20Revision%20-%20CLEAN.pdf>

Initiative Number and Name	2021 WMP Update Quantitative Target	2021 Actual Reported	2021 WMP Update Qualitative Target	2021 Actual Reported	Method of Verification	Energy Safety Finding
7.3.3.3.2 - Covered Conductor Installation – Tree Attachment Remediation	Remediate 500 Tree Attachments	Remediated 520 Tree Attachments	N/A	N/A	QIU, QAL, EC ARC	Commitment met
7.3.3.7.1 - Expulsion Fuse Replacement	330 Fuses Installed or Replaced	350 Fuses Installed or Replaced	N/A	N/A	QIU, QAL, EC ARC	Commitment met
7.3.3.9 Installation of system automation equipment - Advanced Protection	If RARs/RCSs are determined to be necessary, based on the SH-7 analysis	23 Circuits Installed	N/A	N/A	QIU, QAL, EC ARC	Commitment met
7.3.3.12.1 - Other corrective action - Long Span Initiative	300 Remediations	360 Remediations	N/A	N/A	QIU, QAL, EC ARC	Commitment met
7.3.3.15.1 Transmission Maintenance and Replacement	Replace C-Hooks on 40 structures in HFRA	Removed 50 C-Hooks	N/A	N/A	QIU, QAL, EC ARC	Commitment met
7.3.3.16.1 - Undergrounding of electric lines and/or equipment	4 Miles	5.8 Miles	N/A	N/A	QIU, QAL, EC ARC	Commitment met

Initiative Number and Name	2021 WMP Update Quantitative Target	2021 Actual Reported	2021 WMP Update Qualitative Target	2021 Actual Reported	Method of Verification	Energy Safety Finding
7.3.3.17.1 - Distribution overhead system hardening – Transmission open phase detection	10 Circuits	10 Circuits	N/A	N/A	QIU, QAL, EC ARC	Commitment met
7.3.3.17.1 3 - Distribution overhead system hardening – Vertical switches	20 Switches	16 Switches	N/A	N/A	QIU, QAL, EC ARC	Commitment not met
7.3.3.8.1 Grid topology improvements to mitigate or reduce PSPS events - – PSPS - Driven Grid Hardening Work	N/A	N/A	SCE will develop a methodology to project probability of PSPS de-energization and impact. Utilizing this methodology, SCE will adopt a more targeted approach by evaluating highly impacted circuits from the remaining 50% circuits in HFRA		SCE met the target in Q4 after review of the second 50% of riskiest circuits.	Data request Commitment met

Initiative Number and Name	2021 WMP Update Quantitative Target	2021 Actual Reported	2021 WMP Update Qualitative Target	2021 Actual Reported	Method of Verification	Energy Safety Finding
7.3.3.8.2 Grid topology improvements to mitigate or reduce PSPS events – Microgrid Assessment	N/A	N/A	Perform internal assessment of vendor bid and location options. If assessment favorable, issue engineering procurement construction (EPC) contract		SCE met the target of completing internal assessment of vendor bid and location options. Conditional Engineering-Procurement-Construction (EPC) contract is in place with contingency on finalization of land agreement.	Data request Commitment met
7.3.3.17.2 Updates to grid topology to minimize risk of ignition in HFTDs; Legacy facilities	N/A	N/A	Perform evaluation on 5 circuits for possible hardening. Create 2 project plans based on 2020 engineering assessments on low voltage site. Complete 12 additional assessments on grounding studies/lighting arrester.		SCE has met target by completing five Hydro Control Circuits assessments, Completed 2 Low Voltage Site Hardening project plans based on 2020 engineering assessments, and completed 12 additional Grounding Studies/Lighting Arrester assessments.	Data request Commitment met

3.1.4 2021 Asset Management and Inspections Initiatives Analysis

SCE's Asset Management and Inspections initiatives represented 17% of SCE's total planned expenditure for its 2021 WMP Update.²⁶

Energy Safety assessed whether SCE met its quantitative and qualitative commitments in its 2021 WMP Update for its Asset Management and Inspections (Section 7.3.4)²⁷ initiatives. To perform this assessment, Energy Safety reviewed available information, and where necessary, requested additional documentation from SCE. Energy Safety found that in 2021, SCE met its quantitative targets and implemented its verifiable statements for five out of the six Asset Management and Inspections initiative commitments reviewed, as detailed in Table 7 below.

Table 7: Energy Safety's Analysis of Utility's 2021 WMP Update Asset Management and Inspections Initiatives

Initiative Number and Name	2021 WMP Update Quantitative Target	2021 Actual Reported	2021 WMP Update Qualitative Target	2021 Actual Reported	Method of Verification	Energy Safety Finding
7.3.4.4 - Infrared inspections of distribution electric lines and equipment	50% of distribution circuits Inspected	50% of distribution circuits Inspected	N/A	N/A	QIU, QAL, EC ARC	Commitment met
7.3.4.5 - Infrared inspections of transmission electric lines and equipment	1,000 Circuit Miles	1,046 Circuit Miles	N/A	N/A	QIU, QAL, EC ARC	Commitment met

²⁶ Southern California Edison, "Wildfire Safety Division Attachment 2.3 Wildfire Mitigation Plan Quarterly report (Table 12)," June 3, 2021. [Online]. Available: <https://www.sce.com/sites/default/files/AEM/Wildfire%20Mitigation%20Plan/2021/SCE%20Tables%201-12%20Revision.xlsx>

²⁷ Southern California Edison, "2021 Wildfire Mitigation Plan Update" Feb. 5, 2021. pp. 233-256. [Online]. Available: <https://energysafety.ca.gov/wp-content/uploads/docs/wmp-2021/sce-2021-wmp-update.pdf>

Initiative Number and Name	2021 WMP Update Quantitative Target	2021 Actual Reported	2021 WMP Update Qualitative Target	2021 Actual Reported	Method of Verification	Energy Safety Finding
7.3.4.9.1 - Other discretionary inspection of distribution electric lines and equipment, beyond inspections mandated by rules and regulations - distribution high fire risk informed inspections in HFRA	Inspect between 163,000 and 198,000 structures in HFRA, via both ground and aerial inspections	Inspected ~184,900 ground and ~180,300 aerial structures in HFRA	N/A	N/A	QIU, QAL, EC ARC	Commitment met
7.3.4.9.2 - Other discretionary inspection of distribution electric lines and equipment, beyond inspections mandated by rules and regulations - generation high fire risk informed inspections in HFRA	Inspection of 181 generation-related assets in HFRA	Inspected 230 generation-related assets in HFRA	N/A	N/A	QIU, QAL, EC ARC	Commitment met

Initiative Number and Name	2021 WMP Update Quantitative Target	2021 Actual Reported	2021 WMP Update Qualitative Target	2021 Actual Reported	Method of Verification	Energy Safety Finding
7.3.4.10.19 - Other discretionary inspection of distribution electric lines and equipment, beyond inspections mandated by rules and regulations - transmission high fire risk informed inspections in HFRA	Inspect between 16,800 and 22,800 structures in HFRA, via both ground and aerial inspections.	Inspected ~20,800 ground and ~20,800 aerial structures in HFRA.	N/A	N/A	QIU, QAL, EC ARC	Commitment met

Initiative Number and Name	2021 WMP Update Quantitative Target	2021 Actual Reported	2021 WMP Update Qualitative Target	2021 Actual Reported	Method of Verification	Energy Safety Finding
7.3.4.3.1 Improvement of inspections – inspection work management tools	N/A	N/A	Transition Aerial and Transmission ground inspection process to a single digital platform with at least 75% of inspectors trained to use the tool by year end 2021. Deploy scope mapping tool with GIS visualization to Distribution	T&D Aerial completed transition of inspection processes to a single digital platform and met target to train at least 75% of inspectors. Transmission Ground did not complete transition of inspection processes to a single digital platform and did not meet target to train at least 75% of inspectors Key artificial intelligence/machine learning (AI/ML) models met target. Scope Mapping Tool did not meet target to deploy tool to Distribution Planning and Engineering users. Remediation mobile software and iPad devices were deployed for Transmission however target was not met for Distribution users.	Data request	Commitment not met

4. Appendix D

4.1 Ignition Risk and Outcomes Metrics

Energy Safety assessed the performance of SCE's infrastructure relative to its wildfire risk, as measured by changes in the occurrence of events that correlate to wildfire risk.

Energy Safety requires electrical corporations to report data, such as ignitions in the HFTD, that help Energy Safety assess whether an electrical corporation reduced its wildfire risk while also reducing its reliance on PSPS. In 2021, Energy Safety evaluated each electrical corporation's performance metric²⁸ data by conducting the following analyses:

- For Ignition Risk Metrics:
 - a. A trend analysis of performance metrics from 2015-2021.
 - b. A year-over-year analysis of performance metrics from 2020-2021.
- For Outcome Metrics:
 - a. A trend analysis of performance metrics from 2015-2021.
 - b. A year-over-year analysis of performance metrics from 2020-2021.

For this analysis, Energy Safety relied on data reported in SCE's 2021 WMP Update and its March 18, 2022, QDR submission.

4.1.1 Ignition Risk Metrics

Energy Safety reviewed the ignition risk metrics SCE reported in its March 18, 2022, QDR submission,^{29 30} including:

- **Ignitions** – incidents in which electrical corporation infrastructure was involved
- **Wire down events** – incidents in which overhead electrical lines fall to the ground or land on objects

²⁸ Progress Metrics are defined as Measurements that track how much Electrical Corporation wildfire mitigation activity has changed the conditions of Electrical Corporation wildfire risk exposure or Electrical Corporation ability to manage wildfire risk exposure, in terms of leading indicators of ignition probability and wildfire consequences.

Office of Energy Infrastructure Safety, "Office of Energy Infrastructure Safety, 2022 Wildfire Mitigation Plan Update Guidelines Template (Attachment 2)," Dec.15, 2021. [Online]. Available: <https://efiling.energysafety.ca.gov/eFiling/Getfile.aspx?fileid=51912&shareable=true>

²⁹ Southern California Edison, "Office of Energy Infrastructure Safety Attachment 3 Wildfire Mitigation Plan Quarterly report - Q4 2021 (Table 7.1)," Feb. 1, 2022. [Online]. Available: <https://efiling.energysafety.ca.gov/eFiling/Getfile.aspx?fileid=52006&shareable=true>

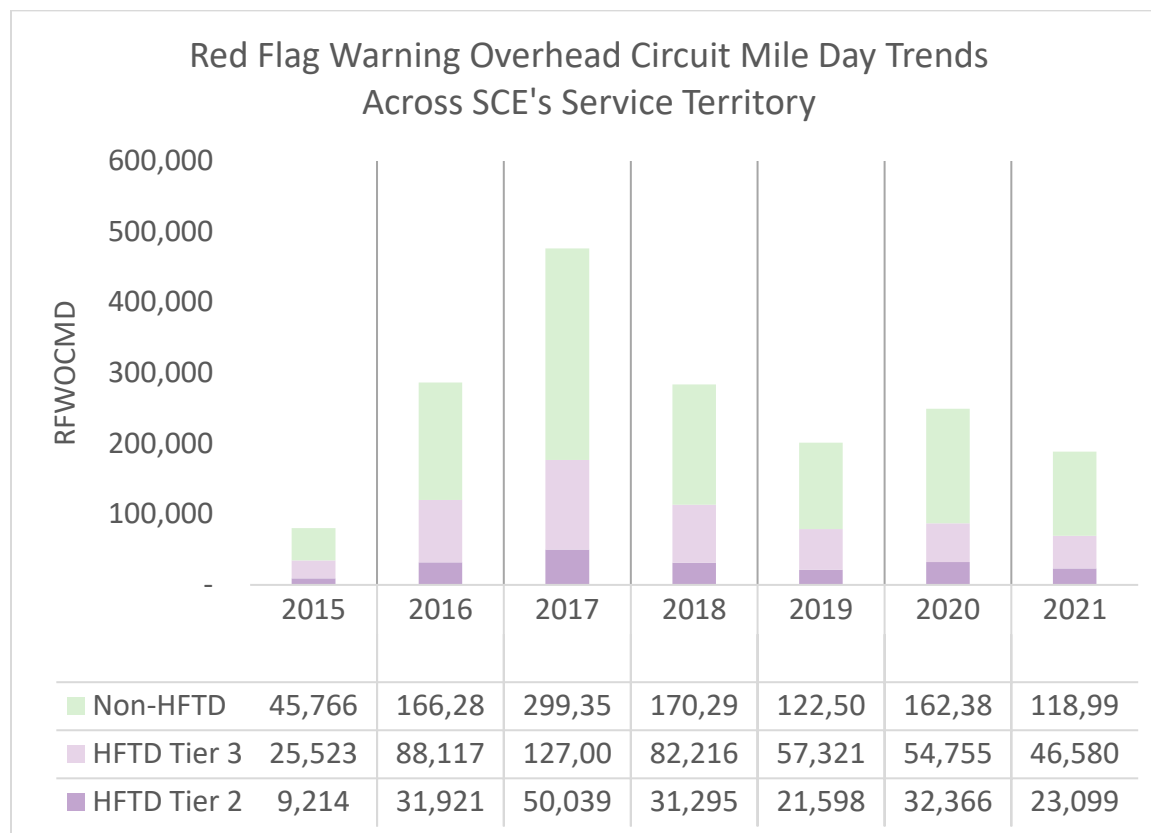
³⁰ Southern California Edison, "Office of Energy Infrastructure Safety Attachment 3 Wildfire Mitigation Plan Quarterly report - Q4 2021 (Table 7.2)," Feb. 1, 2022. [Online]. Available: <https://efiling.energysafety.ca.gov/eFiling/Getfile.aspx?fileid=52006&shareable=true>

- **Vegetation-caused outages** – outages experienced in which the cause was determined to be vegetation contact with electrical lines
- **Unplanned outages** – all unplanned outages experienced

For applicable metrics, Energy Safety normalized each electrical corporation’s data using the unit “Red Flag Warning Overhead Circuit Mile Days” (RFWOCMD). Energy Safety uses RFWOCMD for overhead assets to depict wildfire risk normalized for the size of fire weather events in an electrical corporation’s service territory. Use of this metric allows for comparisons across electrical corporations and enables assessment of performance in 2021 relative to previous trends from 2015 to 2020.

As shown in Figure 1 below, SCE has seen oscillations in RFWOCMDs since 2015 with the highest frequency of RFWOCMDs occurring between 2016 and 2018.

Figure 1: Variances in Extreme Fire Weather Across SCE Territory from 2015-2021 by HFTD location³¹



³¹ Southern California Edison, “Office of Energy Infrastructure Safety Attachment 3 Wildfire Mitigation Plan Quarterly report - Q4 2021,” Feb. 1, 2022. [Online]. Available: <https://efiling.energysafety.ca.gov/eFiling/Getfile.aspx?fileid=52006&shareable=true>.

4.1.2 Ignition Data Analysis

SCE had more total ignitions on its system in 2021 compared to both 2020 and to the six-year average from 2015-2020. 2021 also represented a relatively similar year in terms of number of days with higher risk of fire danger (as measured by RFWOCMDs) when compared to recent years.

Figure 2 shows the number of ignitions across SCE’s service territory normalized by the total RFWOCMD for each year, delineated by location (i.e., Tier 3 HFTD areas, Tier 2 HFTD areas, and non-HFTD areas).

Figure 2: SCE Ignitions from 2015-2021 Normalized by Ignitions in HFTD Tiers/ Total RFWOCMD

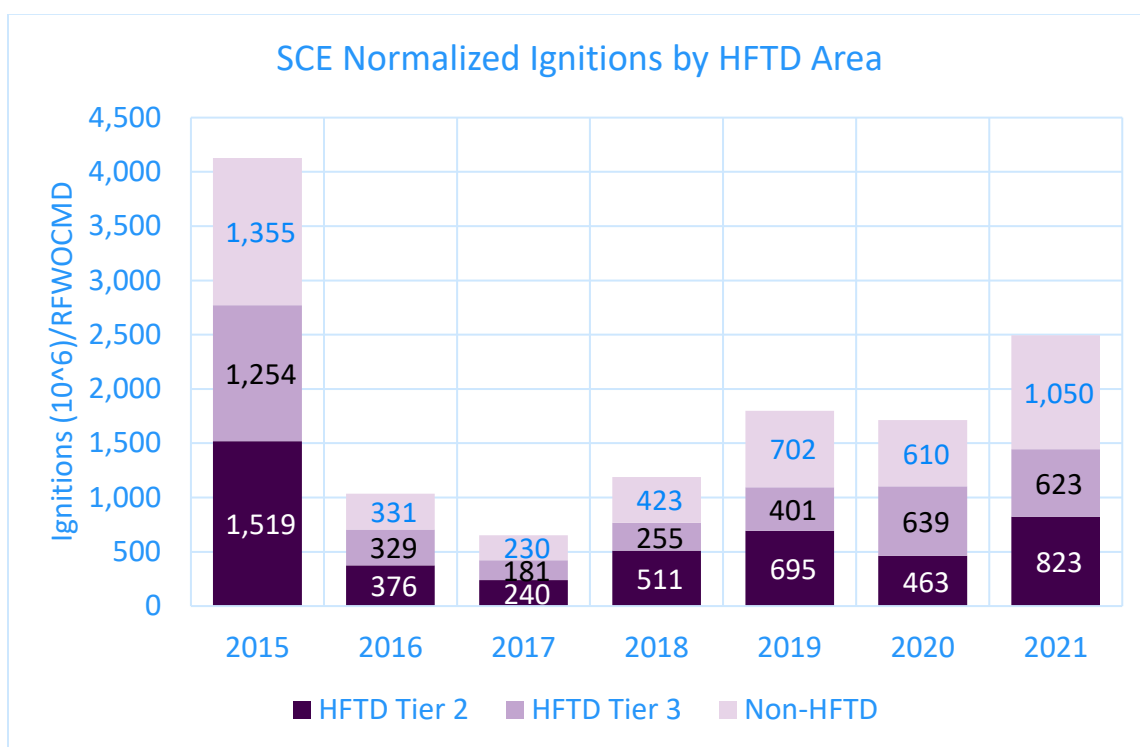


Table 8 shows a time series of SCE utility-related ignitions since 2015. For 2021, the total ignitions of 173 was above the six-year average of 115 ignitions.

Table 8: SCE Count of Utility Related Ignitions (2015-2021)³²

Description	2015	2016	2017	2018	2019	2020	2021	6 Year Avg (2015-2020)
Distribution	100	88	97	106	116	142	168	108
Transmission	8	8	7	3	8	7	5	7
Total	108	96	104	109	124	149	173	115

The following four figures show drivers of SCE normalized ignitions during the 2015 to 2021 period broken out by asset classification and HFTD location risk driver (i.e., Tier 3 and Tier 2). The first two figures show ignitions on the distribution system and the second two figures show ignitions on the transmission system.

As shown in the figures below, with few exceptions, contact from objects was generally the top driver of SCE's normalized ignitions in Tier 2 and Tier 3 HFTD areas across both its distribution and transmission system from 2015 to 2021. For transmission, contacts from objects increased between 2020 and 2021, but for distribution, contacts from objects decreased between 2020 and 2021.

³² Southern California Edison, "Office of Energy Infrastructure Safety Attachment 3 Wildfire Mitigation Plan Quarterly report - Q4 2021 (Table 7.2)," Feb. 1, 2022. [Online]. Available: <https://efiling.energysafety.ca.gov/eFiling/Getfile.aspx?fileid=52006&shareable=true>

Figure 3: SCE Distribution Ignitions in Tier 3 HFTD Areas from 2015-2020
 Normalized by RFWOCMD in Tier 3 Only Broken out by Risk Driver

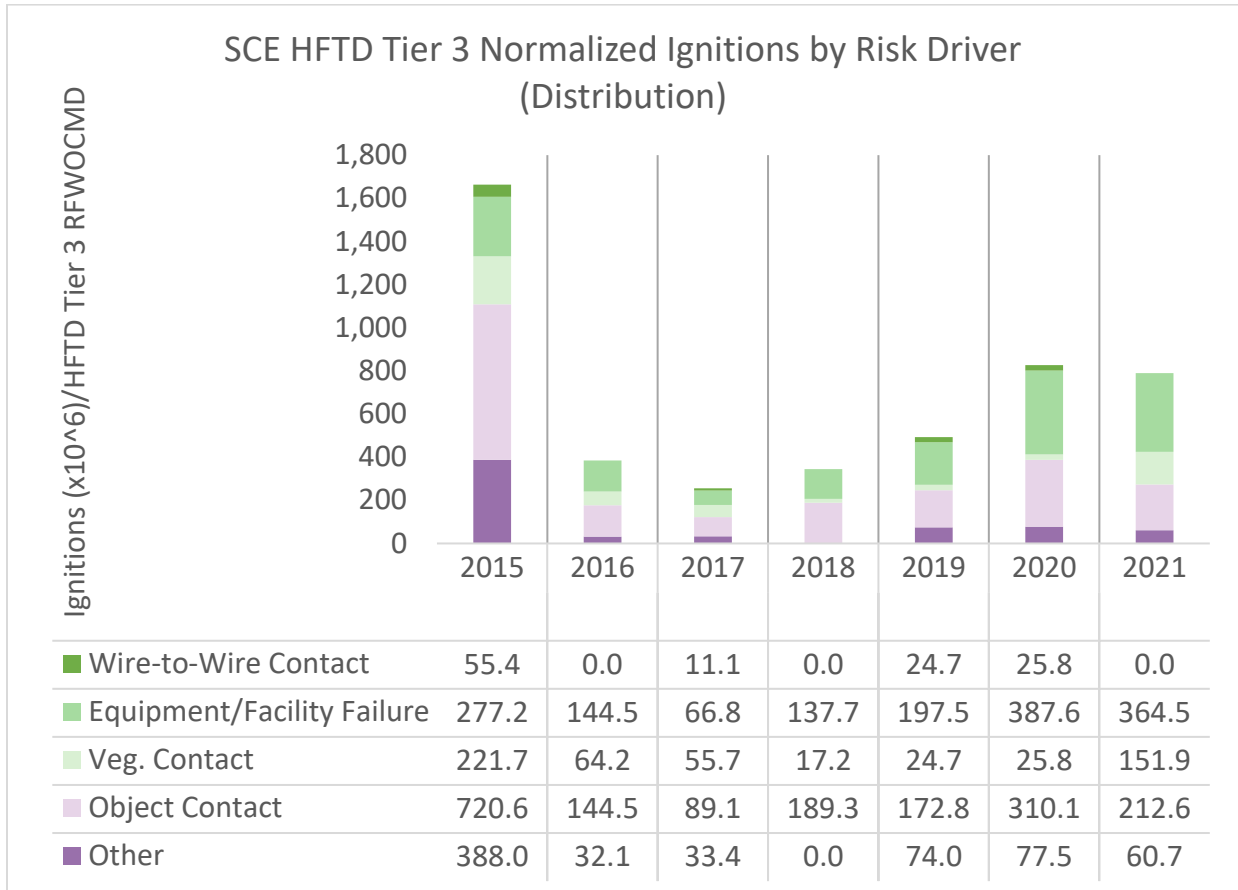


Figure 4: SCE Distribution Ignitions in Tier 2 HFTD Areas from 2015-2021
 Normalized by RFWOCMD in Tier 2 Only Broken out by Risk Driver

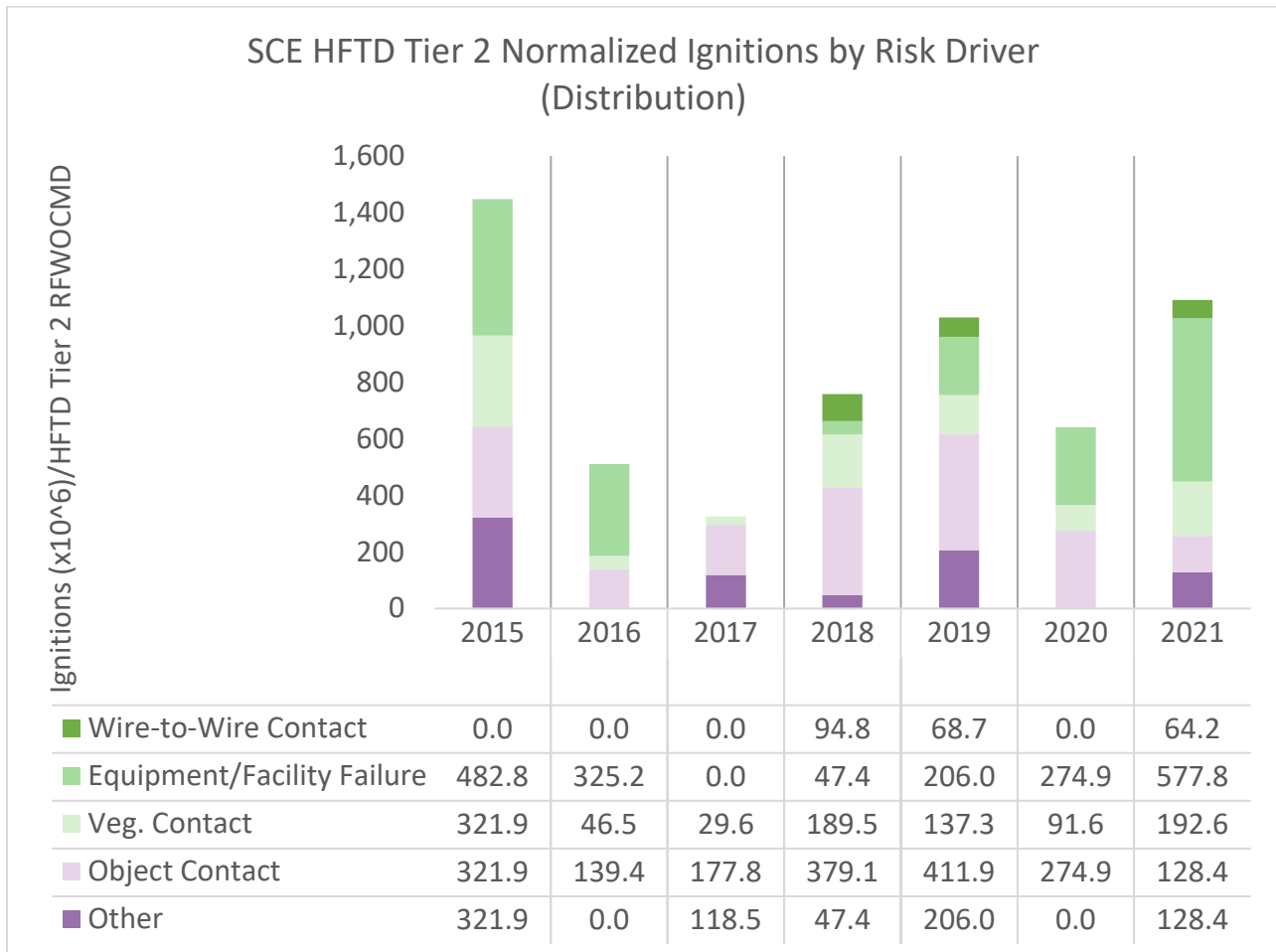


Figure 5: SCE Transmission Ignitions in Tier 3 HFTD Areas from 2015-2021
 Normalized by RFWOCMD Tier 3 Only Broken out by Risk Driver

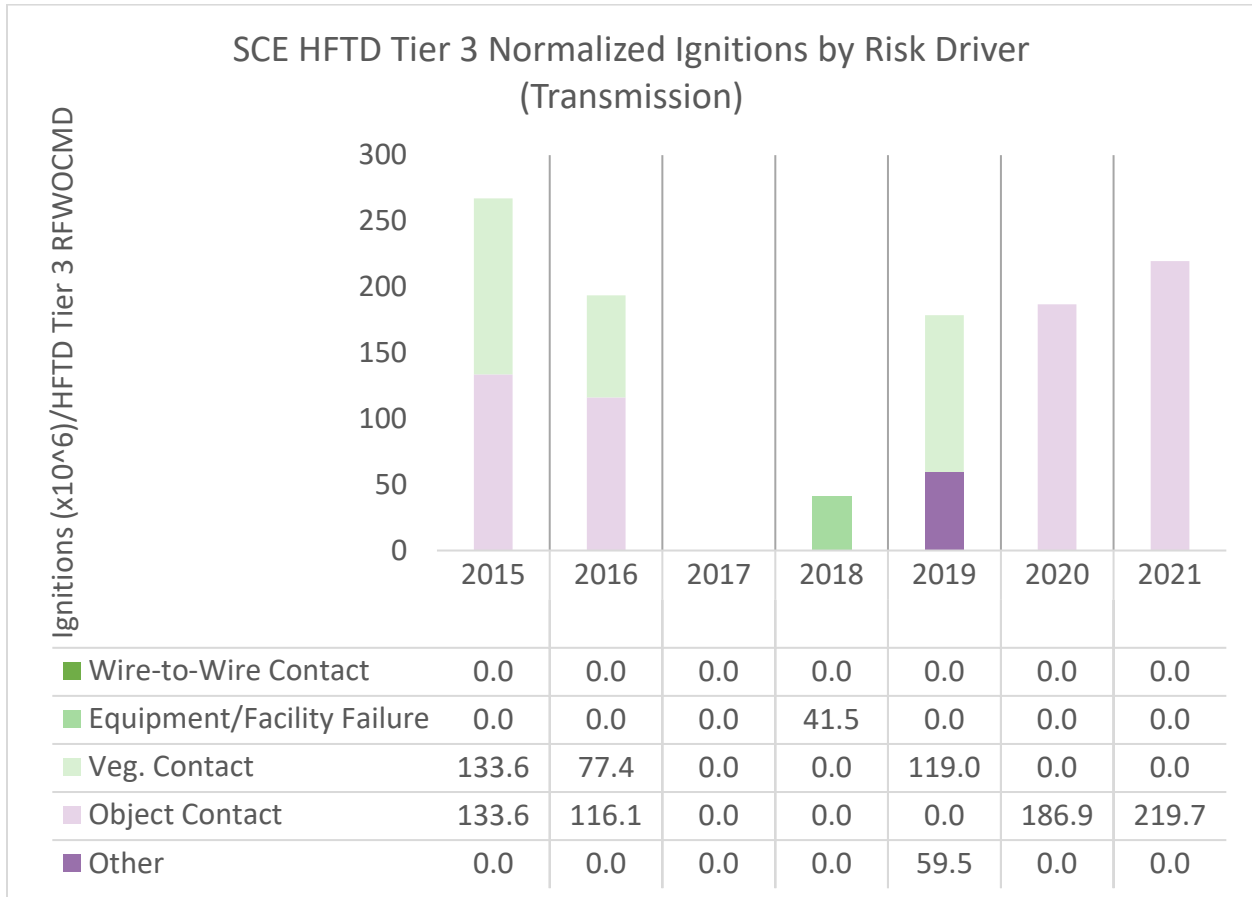
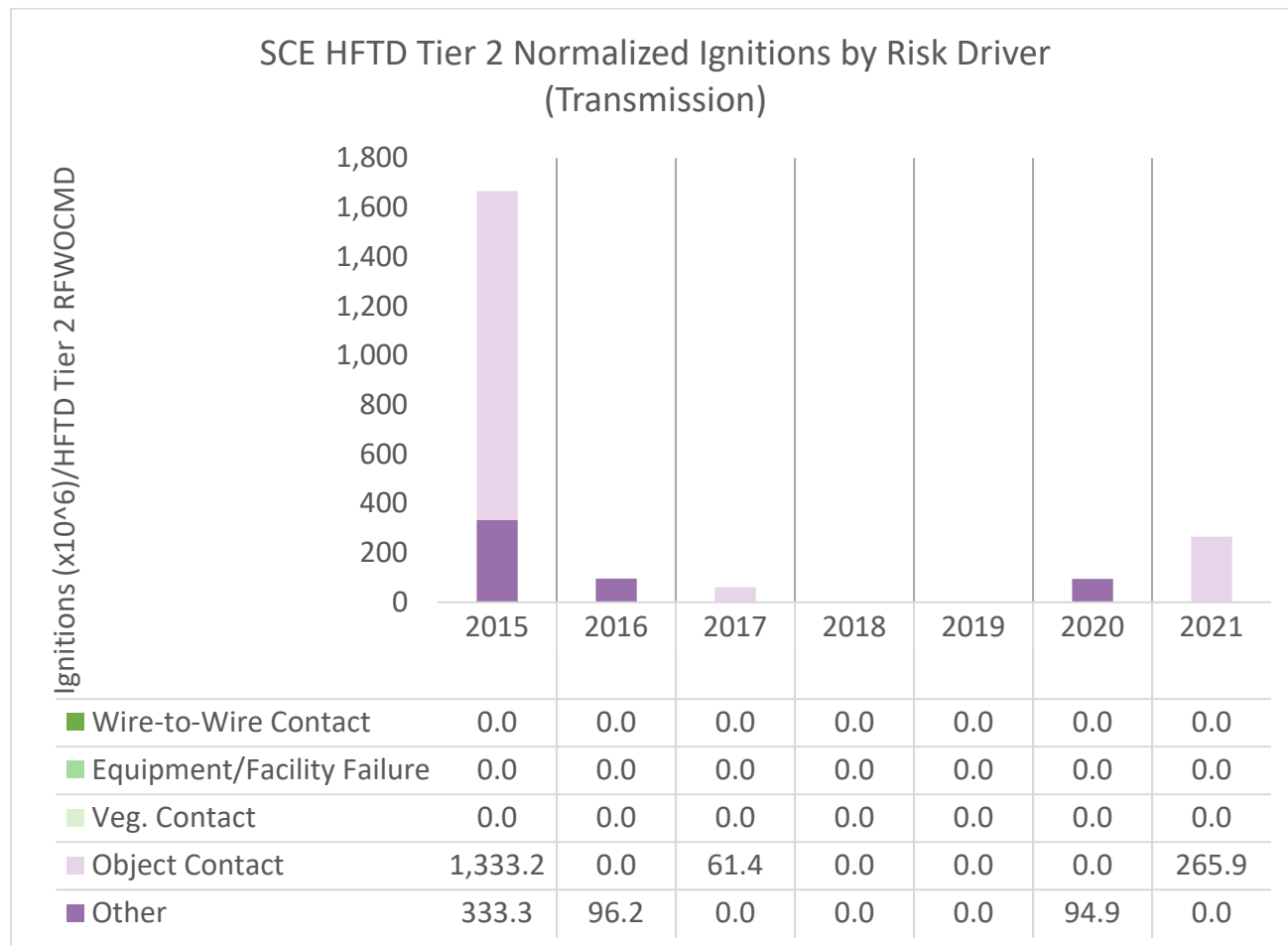


Figure 6: SCE Transmission Ignitions in Tier 2 HFTD Areas from 2015-2021
 Normalized by RFWOCMD Tier 2 Only Broken out by Risk Driver



4.1.2.1 Wire Down Data Analysis

SCE’s overall normalized wire-down events oscillated during the 2015 through 2021 period, with 2021 events being slightly higher than 2020 and approximately 15% higher than the previous six-year average (127.4), driven by distribution wire down events. Conversely, normalized SCE’s transmission wire-down events (1.5) were 25.2% below the previous six-year average (2.0). SCE’s distribution and transmission wire-down events from 2015 through 2021 are normalized for RFWOCMD and plotted below in Figure 7.

While the normalized figures show an increase in wire down events in 2021, the absolute quantity of 2021 wire down events was relatively similar to those experienced in prior years.

Table 9 shows the number of SCE wire-down events for each year since 2015. For 2021, total wire down events of 2,030 fell slightly below the six-year average of 2,050 events. The vast majority of the wire down events occurred on the distribution infrastructure.

Figure 7: SCE Total Wire Down Events from 2015-2021 Normalized by RFWOCMD

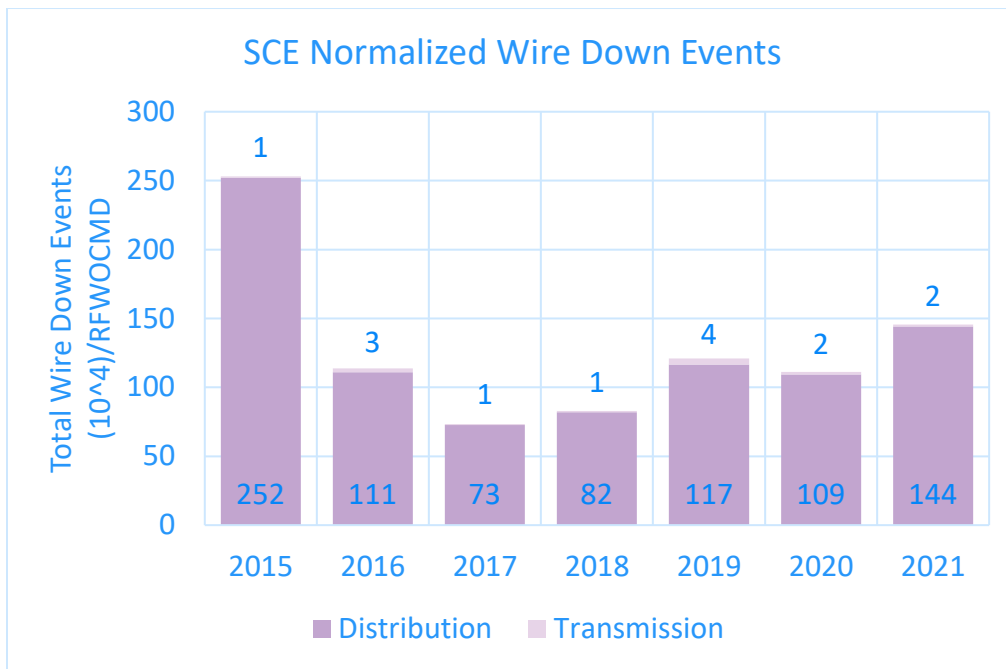


Table 9: SCE Count Wire Down Events (2015-2021)³³

Description	2015	2016	2017	2018	2019	2020	2021	6 Year Avg (2015-2020)
Distribution	1,530	2,394	2,607	1,753	1,769	2,056	2,050	2,018
Transmission	2	20	10	7	22	12	7	12
Total	1,530	2,394	2,607	1,753	1,769	2,056	2,050	2,030

³³ Southern California Edison, “Office of Energy Infrastructure Safety Attachment 3 Wildfire Mitigation Plan Quarterly report - Q4 2021(Table 7.2),” Feb. 1, 2022. [Online]. Available: <https://efiling.energysafety.ca.gov/eFiling/Getfile.aspx?fileid=52006&shareable=true>

4.1.2.2 Outage Data Analysis

Figure 8 below shows SCE's transmission and distribution outages normalized for RFWOCMD.

Table 10 shows a time series of SCE's outage count since 2015.

Figure 8: Outages from 2015-2021 Normalized by RFWOCMD

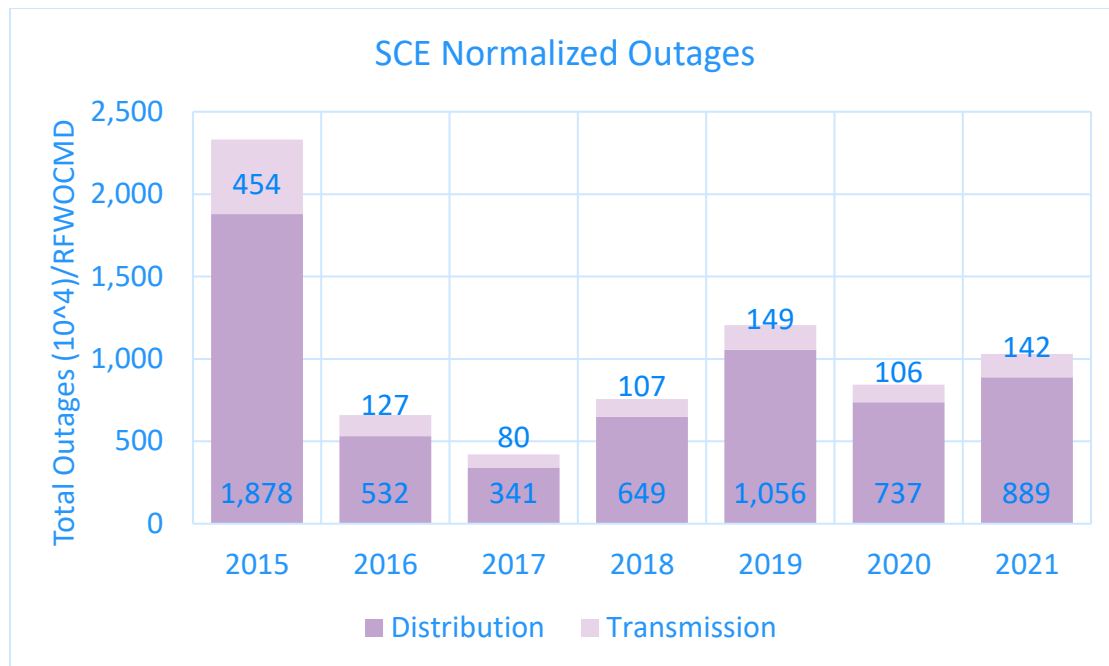


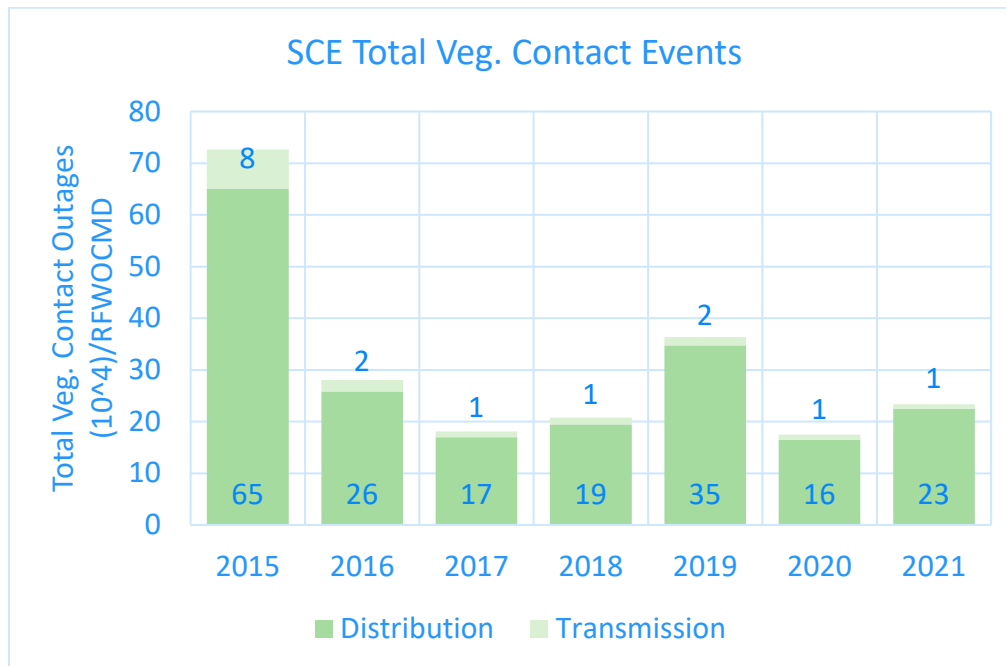
Table 10: SCE Count of Outages (2015-2021)³⁴

Description	2015	2016	2017	2018	2019	2020	2021	6 Year Avg (2015- 2020)
Distribution	11,397	11,475	12,247	13,881	16,026	13,867	12,648	13,149
Transmission	900	897	942	748	739	653	659	813
Total	12,297	12,372	13,189	14,629	16,765	14,520	13,307	13,962

³⁴ Southern California Edison, "Office of Energy Infrastructure Safety Attachment 3 Wildfire Mitigation Plan Quarterly report- Q4 2021 (Table 7.1)," Feb. 1, 2022. [Online]. Available: <https://efiling.energysafety.ca.gov/eFiling/Getfile.aspx?fileid=52006&shareable=true>

Figure 9 below shows SCE's distribution and transmission vegetation contact-caused outages normalized for RFWOCMD.

Figure 9: Outages from Vegetation Contacts for 2015-2020 Normalized by RFWOCMD



4.1.2.3 PSPS Data Analysis

While useful as a wildfire mitigation measure, PSPS carries its own risks to customers. As such, electrical corporations must reduce the duration, scope, and frequency of PSPS events.

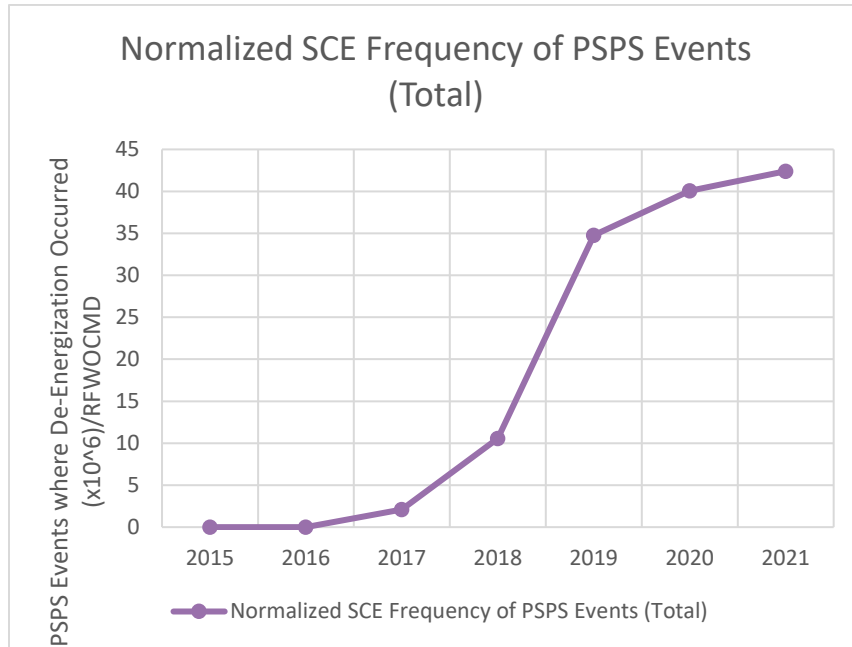
SCE reported data on its use of PSPS events and other PSPS metrics. Again, Energy Safety applied the RFWOCMD metric as a normalizing parameter. Shown in Figure 10 are the number of normalized PSPS events. PSPS events have steadily increased since 2015, with 2021 representing the highest level. Shown in Figure 12 are the normalized scope of PSPS events (measured in number of circuit events), which after rising from 2018, has dropped after 2020. Shown in Figure 11, the normalized duration of PSPS events remained similar to the prior year following a large increase from 2018 to 2019. Similarly, Figure 13 shows the normalized critical infrastructure impacted dropped from 2020 levels after rising since 2015.

In 2021 SCE reported some improvement compared to 2020 as all of the actual PSPS metrics declined from 2020 as follows:

- Frequency of PSPS events, where de-energization occurred, decreased from 10 to eight
- Scope of PSPS events decreased from 424 to 284 circuit events
- PSPS events duration decreased from 4,455,936 to 3,700,254 customer hours

- Critical infrastructure locations impacted, measured as locations per hour multiplied by hours offline, decreased from 5,135 to 4,644
- Number of customers impacted by PSPS events decreased from 229,800 to 200,404 customers

Figure 10: Normalized Frequency of PSPS Events (2015-2021)³⁵



³⁵ Southern California Edison, “Office of Energy Infrastructure Safety Attachment 3 Wildfire Mitigation Plan Quarterly report- Q4 2021,” Feb. 1, 2022. [Online]. Available: <https://efiling.energysafety.ca.gov/eFiling/Getfile.aspx?fileid=52006&shareable=true>

Figure 11: Normalized Scope of PSPS Events (2015-2021)³⁶

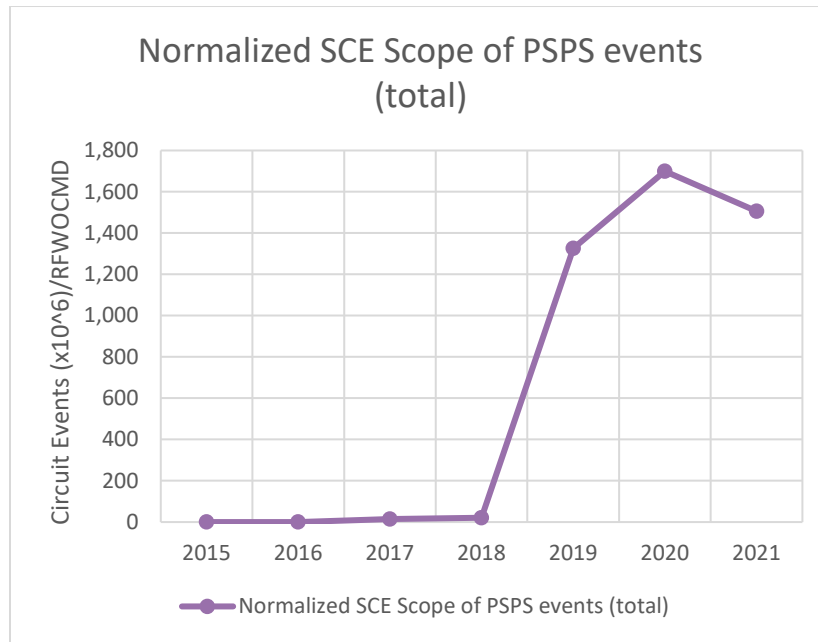
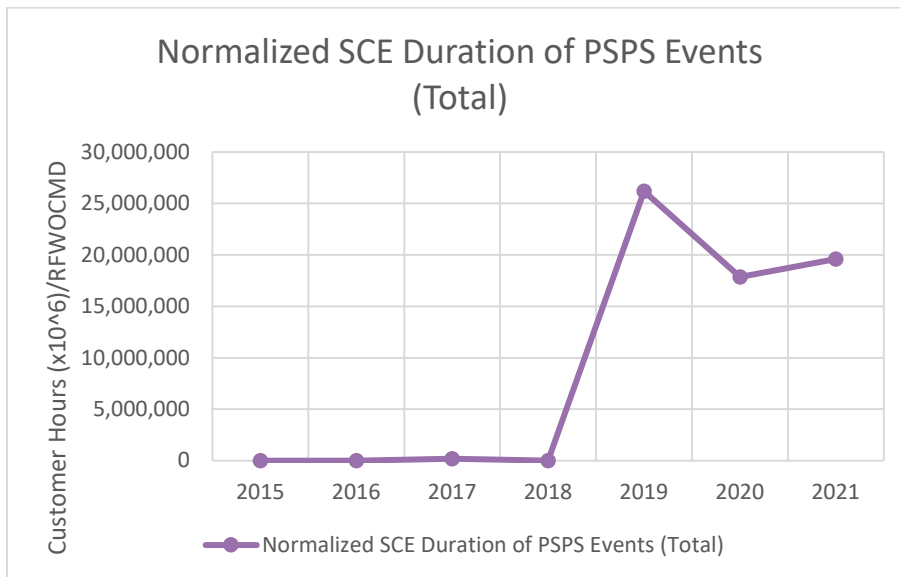


Figure 12: Normalized Duration of PSPS Events³⁷

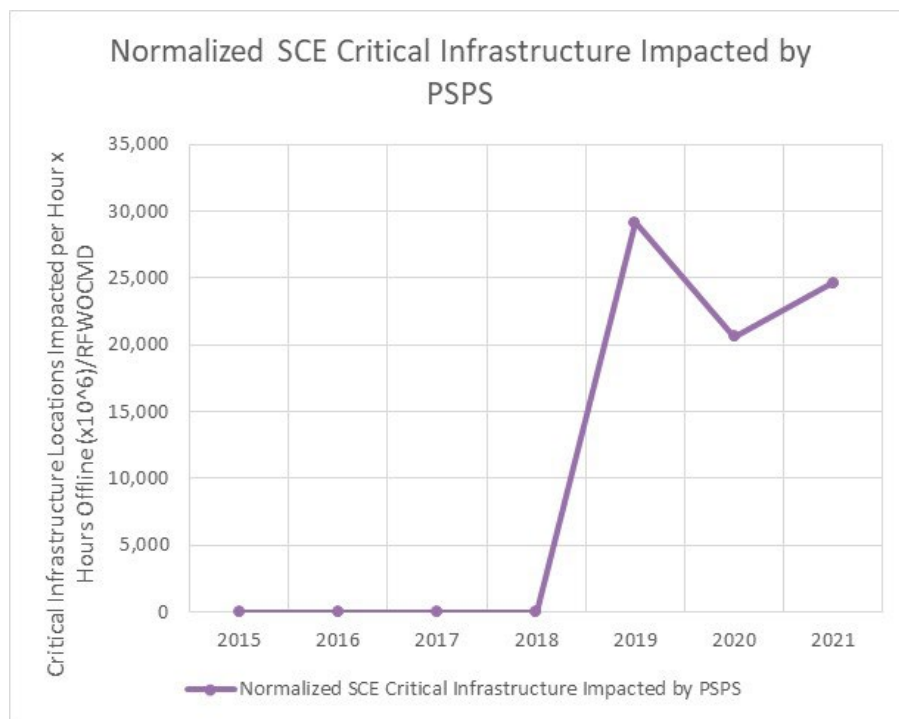


³⁶ Southern California Edison, “Office of Energy Infrastructure Safety Attachment 3 Wildfire Mitigation Plan Quarterly report – Q4 2021,” Feb.1, 2022. [Online]. Available:

<https://efiling.energysafety.ca.gov/eFiling/Getfile.aspx?fileid=52006&shareable=true>

³⁷ Southern California Edison, “Office of Energy Infrastructure Safety Attachment 3 Wildfire Mitigation Plan Quarterly report – Q4 2021,” Feb.1, 2022. [Online]. Available:

<https://efiling.energysafety.ca.gov/eFiling/Getfile.aspx?fileid=52006&shareable=true>

Figure 13: Normalized Critical Infrastructure Outage Customer-Hours due to PSPS (2015-2021)³⁸

4.1.3 Outcome Metrics

This section presents outcome metrics on electrical corporation-related wildfires including:

1. Acres burned
2. Structures damaged/destroyed
3. Injuries/fatalities
4. Value of assets destroyed

Table 11 below provides Energy Safety's assessment of SCE short and long-term outcome patterns.

³⁸ Southern California Edison, "Office of Energy Infrastructure Safety Attachment 3 Wildfire Mitigation Plan Quarterly report – Q4 2021," Feb.1, 2022. [Online]. Available: <https://efiling.energysafety.ca.gov/eFiling/Getfile.aspx?fileid=52006&shareable=true>

Table 11: SCE Outcome Metrics Observations

Description
Short-Term Patterns, 2020 – 2021
<ul style="list-style-type: none"> • Acreage burned by SCE-ignited wildfire decreased from 129,312 to 596. • Structures damaged or destroyed by SCE-ignited wildfires decreased from 60 to 0 structures. • Injuries related to wildfires dropped from 8 to 0 and there were no fatalities.
Long-Term Patterns, 2015 – 2021
<ul style="list-style-type: none"> • Acreage burned increased from 2015 to 2017 where it peaked at 292,051 acres burned. Between 2017 and 2019 acreage burned trended downward followed by an increase in 2020 and a drop off in 2021. • No fatalities or injuries occurred in 2021, compared to an average of four from 2015 to 2020. • No critical infrastructure structure damage occurred in 2021, compared to an average of 11 from 2015 to 2020. • No structures were destroyed in 2021, compared to an average of 527 from 2015 to 2020. • The total value of destroyed assets from SCE-ignited wildfires peaked in 2018 (\$3.3B) and then has declined to its lowest amount of \$3,716,690 in 2021.