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Wildfire Safety Working Group Meeting Mitigation Strategies and Priorities

August 14, 2024

Agenda

- Recap of last meeting
- Wildfire mitigation options
  - Group discussion
- Q&A
- Next Steps

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Recap of Last Meeting

Recap of Last Working Group Meeting

Purpose

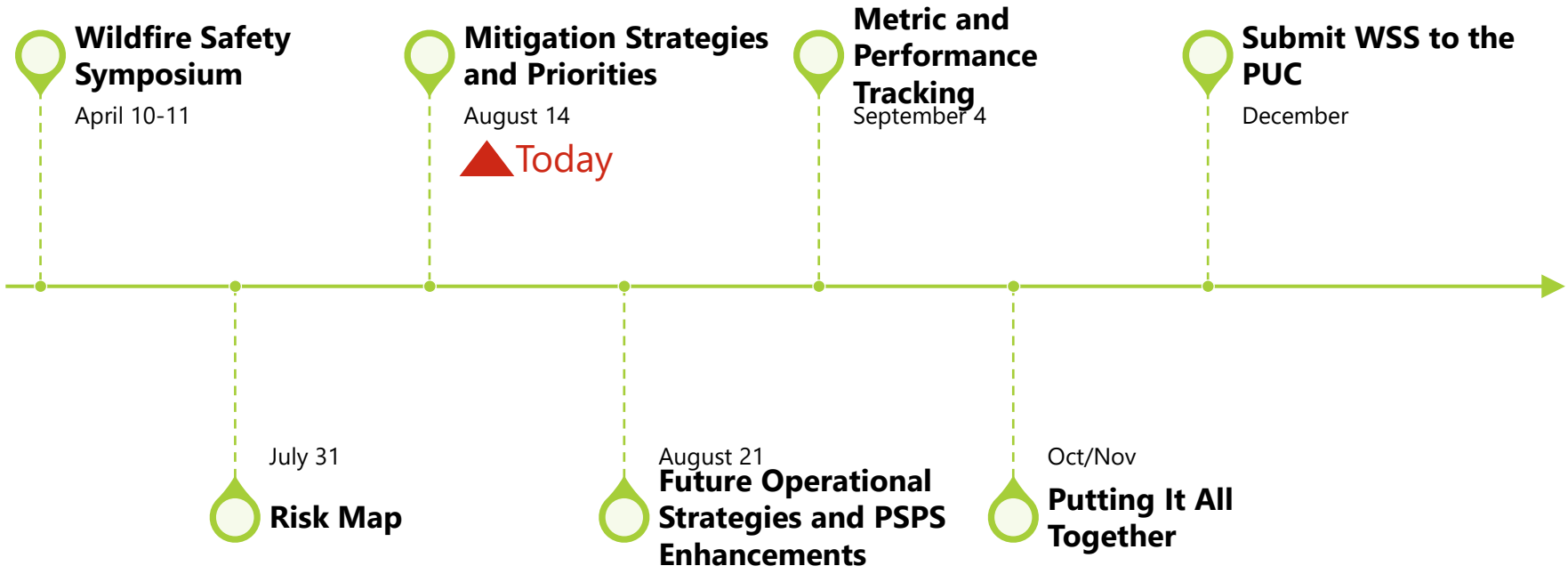
- Overview of the Wildfire Safety Strategy Process
- Objectives, roles and responsibilities of the Wildfire Safety Working Group
- Review and seek feedback of updated tiered risk maps
- Discussed working group schedule and topics to be covered

Summary

- Hawaiian Electric will share an outline of the WSS and review last legislative session bills and testimony on wildfire protection plans
- Reviewed methodology to determined high, medium, low tiered risk maps with stakeholders
- Sought feedback on updated risk maps

WG Webpage - Meeting Materials and Notes Available: https://www.hawaiianelectric.com/safety-and-outages/wildfire-safety/wildfire-safety-working-group-documents

Proposed Timeline for WFS WG



Today's Objectives

Review proposed wildfire mitigation strategies

Seek feedback on strategies, challenges, opportunities and additional considerations

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Wildfire Mitigation Options

Overview of Utility Wildfire Mitigation Process

Mitigation Identification

Mitigations are intended to directly address ignition drivers through grid hardening and operational improvements

Mitigation Prioritization

Scope and implementation of mitigations are prioritized starting with areas that are estimated to have the highest risks based on fire spread modeling (consequence based)

Mitigation Implementation

Properly sited mitigations will reduce the probability of ignition at specific locations on distribution and transmission lines

Emerging Solutions

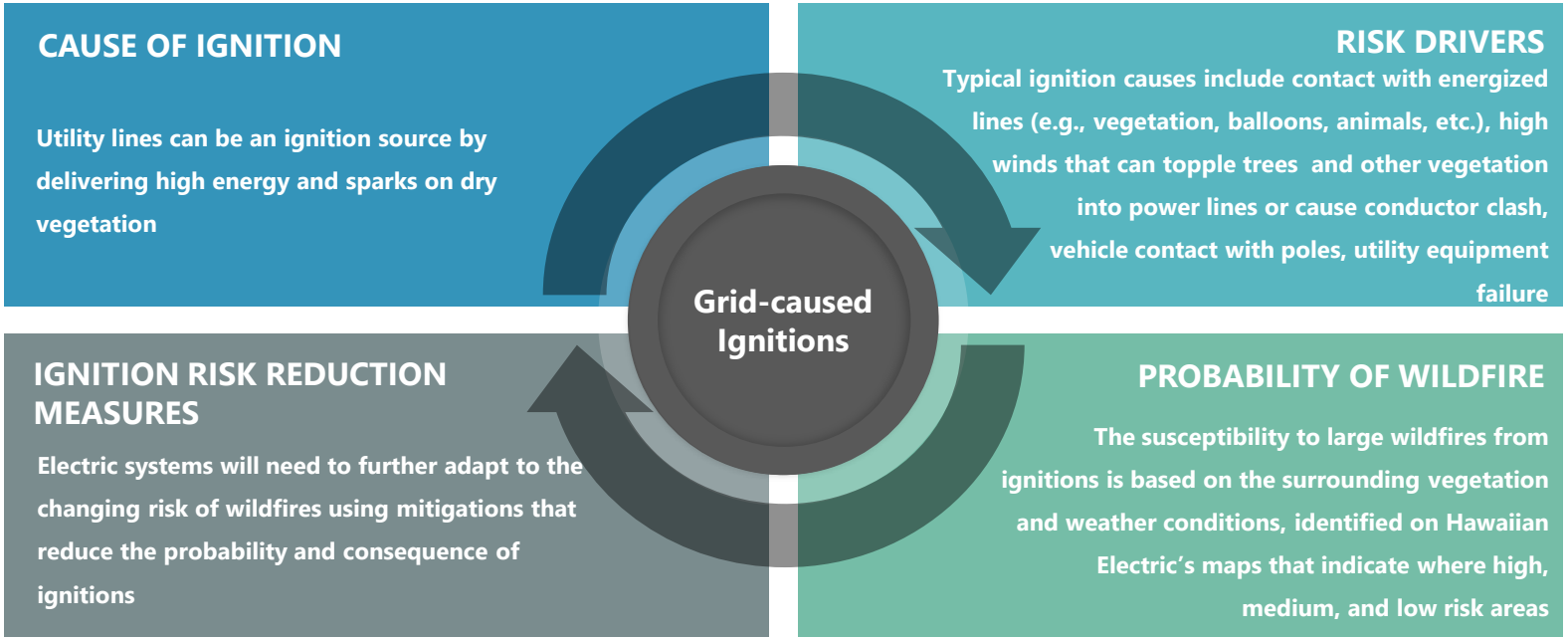
Longer term mitigations will enable new technologies to continually reduce risk with changes in climate and fire risk

Ongoing Monitoring

Performance assessment of implemented mitigation options based on performance metrics.

System Hardening Wildfire Mitigations

Ignition Risks from Utility Systems



Ignition Risk Drivers

Branches	Overgrown	Tree	Unknown
High Winds	Accident – Auto	Accident – Construction	Object in Line – Animal
	Object in Line – Balloon	Object in Line – Foreign Object	

Portfolio of Proposed Mitigations

Wildfire Mitigation Options

Harden the Grid

- Type of grid hardening is based on the severity of risks, feasibility of installation, and estimate of mitigation effectiveness
- Replacing aging and riskier equipment preemptively (such as but not limited to)
  - Adding line spacers to reduce the potential of conductor clash during high winds
  - Replacing bare overhead conductor with covered conductors
  - Targeting undergrounding where appropriate

Operational Improvements

- Enhancing equipment inspections and vegetation management
  - Conducting additional ground and drone aerial inspections with a focus on reducing potential ignition sources
  - Removing hazard trees that could strike power lines and trimming vegetation further away from energized lines
- Implementing enhanced power line safety settings and PSPS (to be covered in the next meeting)
  - Can be deployed rapidly and considered highly effective at mitigation wildfires, but has a direct reliability impact
- Installing weather stations and high-definition cameras
  - Intended to support emergency response

Mitigation Options Under Review

- Covered Conductor
- Line Equipment Installations and Replacements
- Pole Replacement Standards and Policies
- Underground Lines
- Conductor Clash Mitigation
- Replace Small or Degraded OH Conductor
- Additional Options

Wildfire Safety Measures Illustration

- **Group discussion**
  - What utility mitigations need more clarification, and what might be missing?
  - Are there any other mitigations that can support reducing wildfire risk?

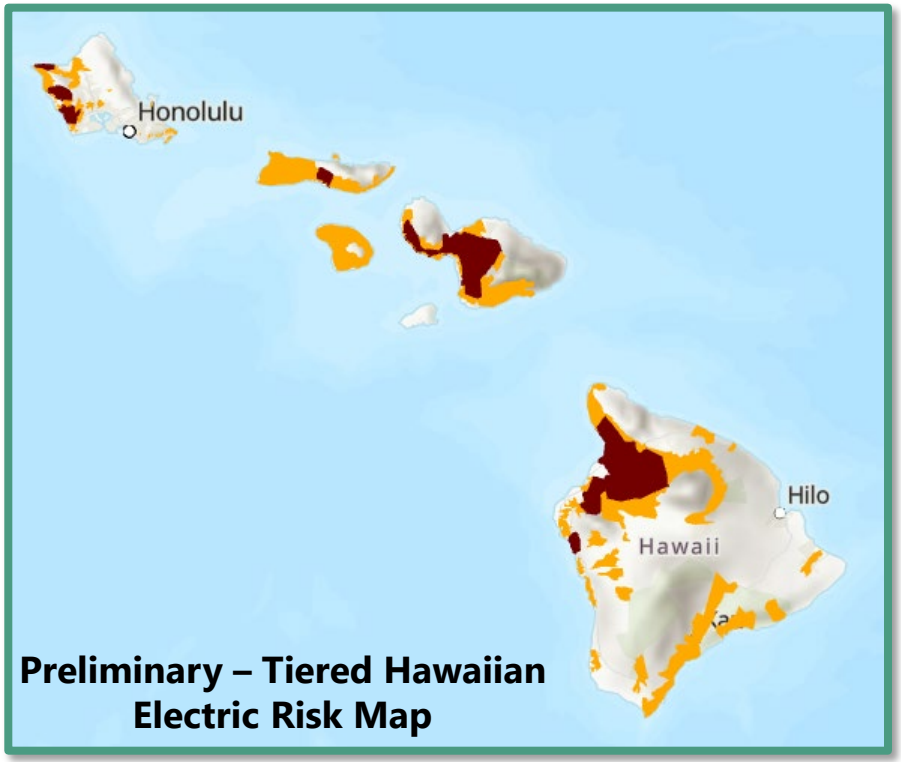
Fire resistant pole wrap

Distribution Line Spacers

Risk Mapping

- **3-tiered system**
  1. *Low risk area*
  2. *Medium risk area*
  3. *High risk area*

- **Inputs**
  - Use fire history perimeters from Pacific Fire Exchange
  - Use vegetation classification from LandFire (joint Federal data product including input from USFS and USGS, among others)
  - Determine vegetation types that have highest frequency of wildfire history



Preliminary – Tiered Hawaiian Electric Risk Map

Risk Mapping Tier Methodology

High-risk area

- Combine with knowledge of trade wind direction, and presence of Hawaiian Electric infrastructure to determine highest risk areas
- Contiguous areas of “red” vegetation, AND
  - Electric infrastructure nearby or directly NE, AND
  - Community in area or directly W or SW

Medium-risk area

- Regardless of wind direction or presence of community
- Contiguous areas of “red” vegetation (those areas not met in High-risk areas above)
- Contiguous areas of “orange” vegetation that have fire history

Low-risk area

- Everything else

Risk methodology will continuously improve over time.

The Economics Of Wildfire Mitigation

- Wildfire risk mitigation involves multi-objective goals that need to be balanced.
- Balancing goals requires developing a risk-informed, data-driven prioritization of wildfire mitigation options
  - Identifies areas of more significant risks and appropriate levels of mitigation
  - Better supports managing financial, operational, and environmental considerations
  - Results in more rapid risk reduction per year or per dollar invested

Prioritization Approach

Identify Key Risk Drivers | **Develop Mitigation Initiatives** | **Map Mitigations to Risk Drivers** | **Evaluate & Prioritize Mitigations** | **Develop Executable Workplan**

- Prioritization involves assessing locational risk based on vegetation, fire spread modeling, fire and fault history to identify location and timing of mitigations
  - Deployment of mitigations will occur in the identified highest risk areas first
  - Next locations based on fire spread modeling and where the consequences of wildfires are the most significant
- Specific mitigations are chosen based on the estimated effectiveness against preventing ignitions that result from electrical faults
  - While grid hardening work will be based on its ability to mitigate certain types of known fault and outage causes, operational mitigations such as vegetation management and inspections will occur on a continuous basis

Prioritization Approach

Potential quantitative factors	+	Potential qualitative factors
Social vulnerability		SME feedback
PSPS impact		Implementation time
Top risk circuit segment		Material availability
Cost to customers		Ingress/egress considerations
Risk spend efficiency		Access constraints
		Labor availability

- **Group discussion**
  - What additional considerations should there be with prioritizing wildfire mitigations?
  - Are there additional areas of concern not listed?

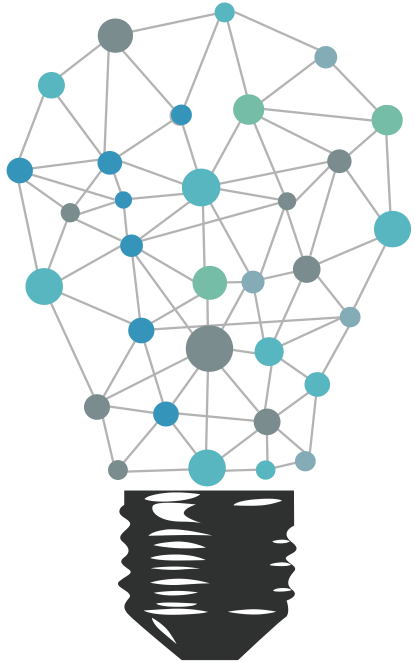
Wildfire Mitigation Challenges and Opportunities

CHALLENGES	VS	OPPORTUNITIES
• Access to infrastructure on private lands • Increased planned maintenance outages for grid hardening • Reduction in reliability due to the impacts of more immediate operational measures such as fast trip settings and PSPS • Rapid growth and regrowth of vegetation, and difficulty in performing routine maintenance in certain areas • Need for additional rapid response fire suppression capabilities • Need for more complete historical data on weather, vegetation, fire history		• Address wildfire mitigations and other reliability and resiliency issues as part of the wildfire safety strategy implementation • Increase public/private partnerships with mitigating wildfires (Enabling agency and public access to weather stations and high-definition cameras) • Work collectively to improve resiliency across critical services including water, telecom, and natural gas • Reduce costs by streamlining permitting, environmental reviews, and access issues • Increase access to information and resources to further engage communities to better ensure public safety and resiliency • New technologies using satellite and other fire detection capabilities • Longer range studies on the impact of climate change on evolving wildfire risks • Additional funding

Wildfire Mitigation Challenges and Opportunities

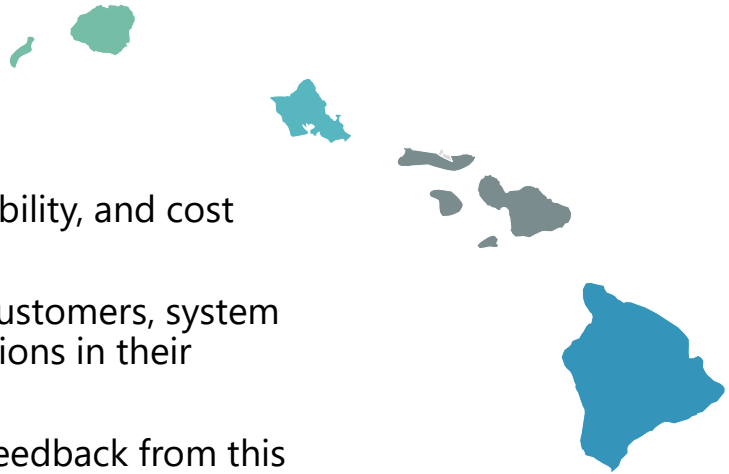
- **Group discussion**

- Describe any additional challenges, opportunities, and possible strategies to enable solutions that haven't been covered
  - What additional challenges and corresponding solutions should be considered?
  - Are there additional stakeholders that should be engaged?



Key Points

- Hawaiian Electric is looking at a wide range of mitigations (building on work underway as part of the interim wildfire plan)
- Mitigation selection will rely on the wildfire risk mapping and risk model work underway
- Mitigation prioritization will consider risk reduction, feasibility, and cost effectiveness
- Hawaiian Electric is considering energy affordability for customers, system reliability, and public safety and other societal considerations in their decision-making processes
- Mitigation selection and prioritization process will seek feedback from this stakeholder group
- This process will continue to evolve as more knowledge and experience are gained and new technologies and industry standards are developed



Next Steps

Next Meeting

August 21

Operational Strategies and Enhanced PSPS

Feel free to provide any additional feedback

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Mahalo!