Lesley K. McAllister Symposium on Climate and Energy Law

Energy Resilience and Extreme Weather Events

November 5, 2021

CPUC Commissioner Darcie Houck

California Public Utilities Commission

Climate Adaptation

Adaptation and Mitigation: Two Different Responses to the Same Problem

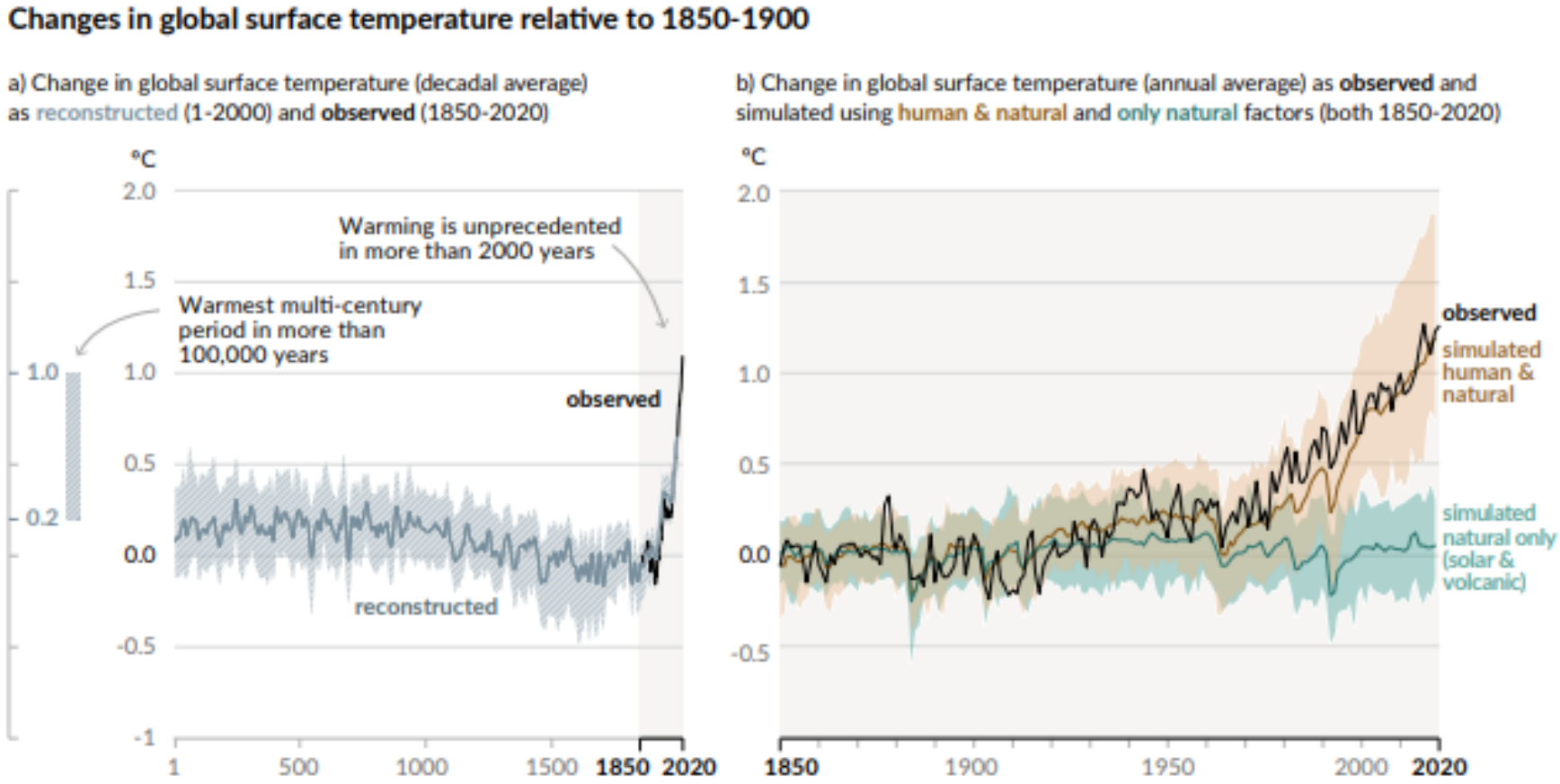
Mitigation	human intervention to reduce the sources or enhance the sinks of greenhouse gases
Adaptation	an adjustment in natural or human systems in response to actual or expected climatic stimuli or their effects, which moderates harm or exploits beneficial opportunities'

Example: Your houseboat is sinking due to a leak. Bailing out the boat is an adaptation response. Sealing the leak is a mitigation response.

Defining Climate Adaptation in the Energy Utility Context

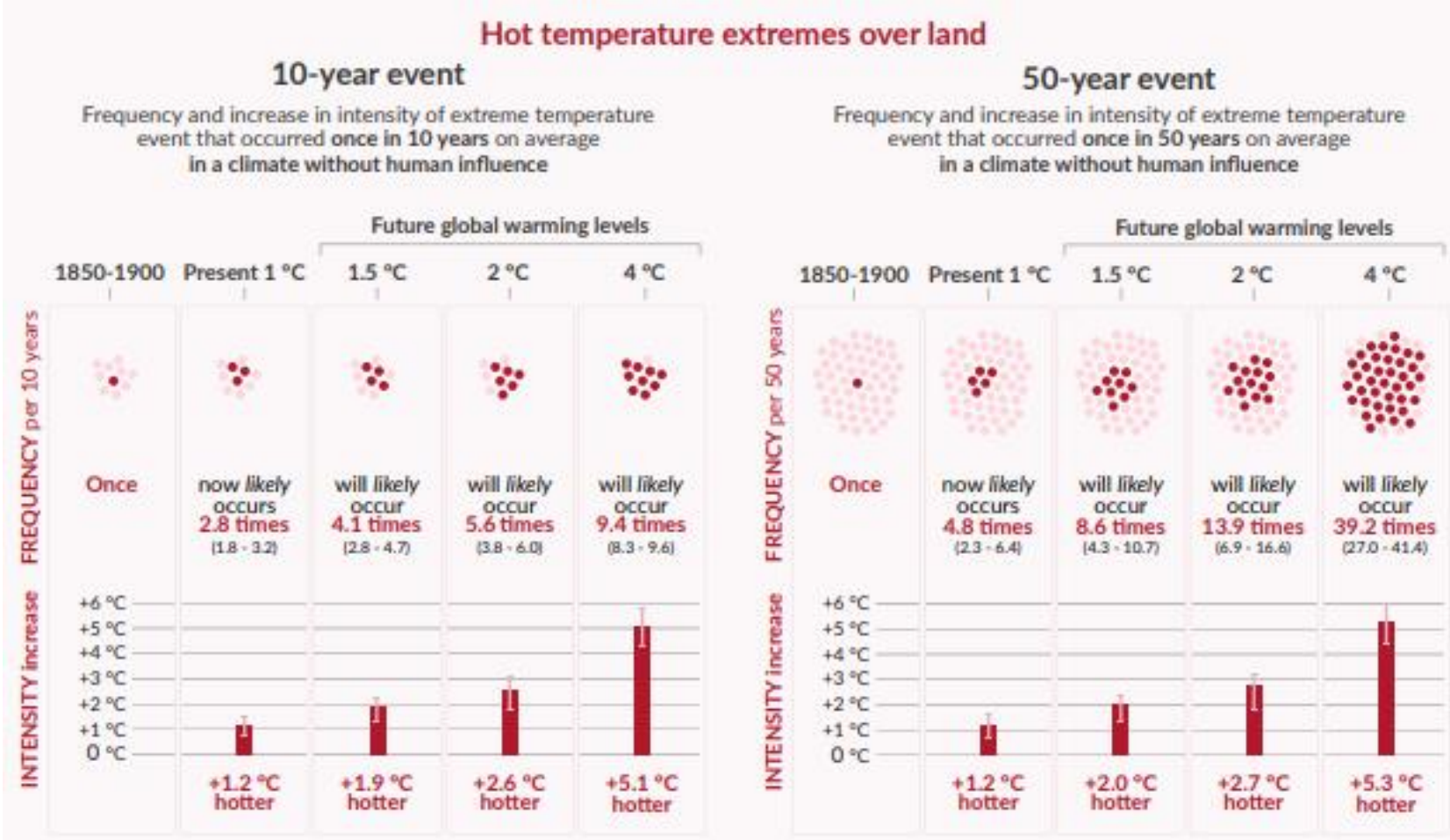
- Climate change adaptation is adjustment in natural and human systems to a new or changing environment. Adaptation to climate change for energy utilities regulated by the Commission refers to adjustment in utility systems using strategic and data-driven consideration of actual or expected climatic impacts and stimuli or their effects on utility planning, facilities maintenance and construction, and communications, to maintain safe, reliable, affordable and resilient operations. (D. 19-10-054).
- Link to the CPUC climate adaptation webpage: Climate Change (ca.gov)

Intergovernmental Panel On Climate Change (IPCC)'s Sixth Assessment Report (AR6)



Source: Figure SPM.1, IPCC_AR6_WGI_SPM.pdf

AR6 Findings: Impact of a Changing Climate on Extreme Weather Events



Source: Figure SPM.6, IPCC_AR6_WGI_SPM.pdf

California's Fourth Climate Assessment

[Link: California Climate Change Assessment]

California's Fourth Climate Assessment Shows How Climate Impacts are Intensifying

If green house gas emissions…	**Are reduced by a moderate rate…**	**Then California will experience average daily high temperatures that are warmer than historical average by…**	**2.5°F** from 2006 to 2039.	**4.4°F** from 2040 to 2069.	**5.6°F** from 2070 to 2100.
	Continue at current rates…		**2.7°F** from 2006 to 2039.	**5.8°F** from 2040 to 2069.	**8.8°F** from 2070 to 2100.

Source: California's Changing Climate, p.5. https://www.energy.ca.gov/sites/default/files/2019-11/20180827_Summary_Brochure_ADA.pdf.

Climate Adaptation Framework Established in D. 20-08-046

- **Vulnerability Assessments**
  - study how projected changes in climate variables may affect their infrastructure, services, and operations
  - climate variables will include: temperate, sea level, variations in precipitation, including snow pack, drought, and subsidence, wildfire, and cascading impacts.
  - Cover a time period of 20 to 30 years in the future

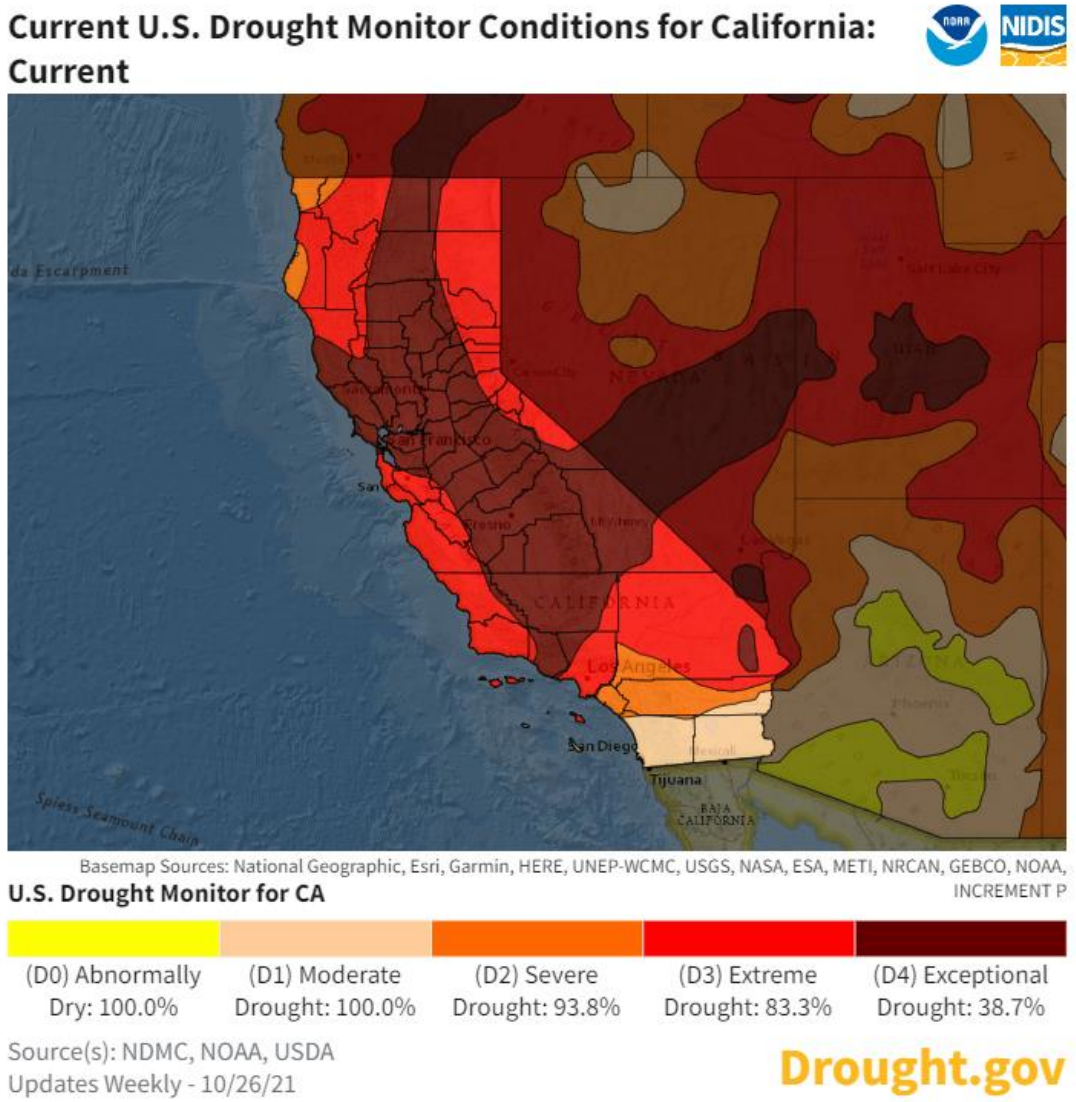
Climate Adaptation Framework Established in D. 20-08-046 (Continued)

- **Community Engagement**
  - Community Engagement Plans
  - Disadvantaged Vulnerable Communities
  - Assessment of effectiveness of community outreach
- **Identify possible adaptation measures**
  - Inform future requests in General Rate Cases

Drought

Accounting for Droughts in a Changing Climate

- Almost all of California is experiencing "severe" drought conditions, and nearly 40% of California is experiencing "exceptional" drought - the most severe drought category designated by the United States Drought Monitor.
- Drought has a cross-industry impact for our regulated utilities.
- Water utilities and their customers may face voluntary or mandatory use restrictions, often enforced by penalty rates.
- CPUC energy staff is updating projection models used in our IRP and RA proceedings to reflect various scenarios of increased temperatures, prolonged drought, and other scenarios that would impact hydropower availability.



Telecommunications

Ensuring Access to Communications During Emergencies

- Decisions 20-07-011 and 21-02-029apply to wireless and wireline providers
- 72 hours of back-up power
- Minimum level of service
- Communications resiliency plans
- Annual emergency operations plans

Post-Disaster Coordination

15 days

- 1. facilities or equipment damaged
- 2. restoration and/or rebuild plans
- 3. date the utilities received access to damaged area
- 4. the timeline to make repairs
- 5. any changes to any infrastructure required
- 6. Utility contact responsible for community engagement

30 days

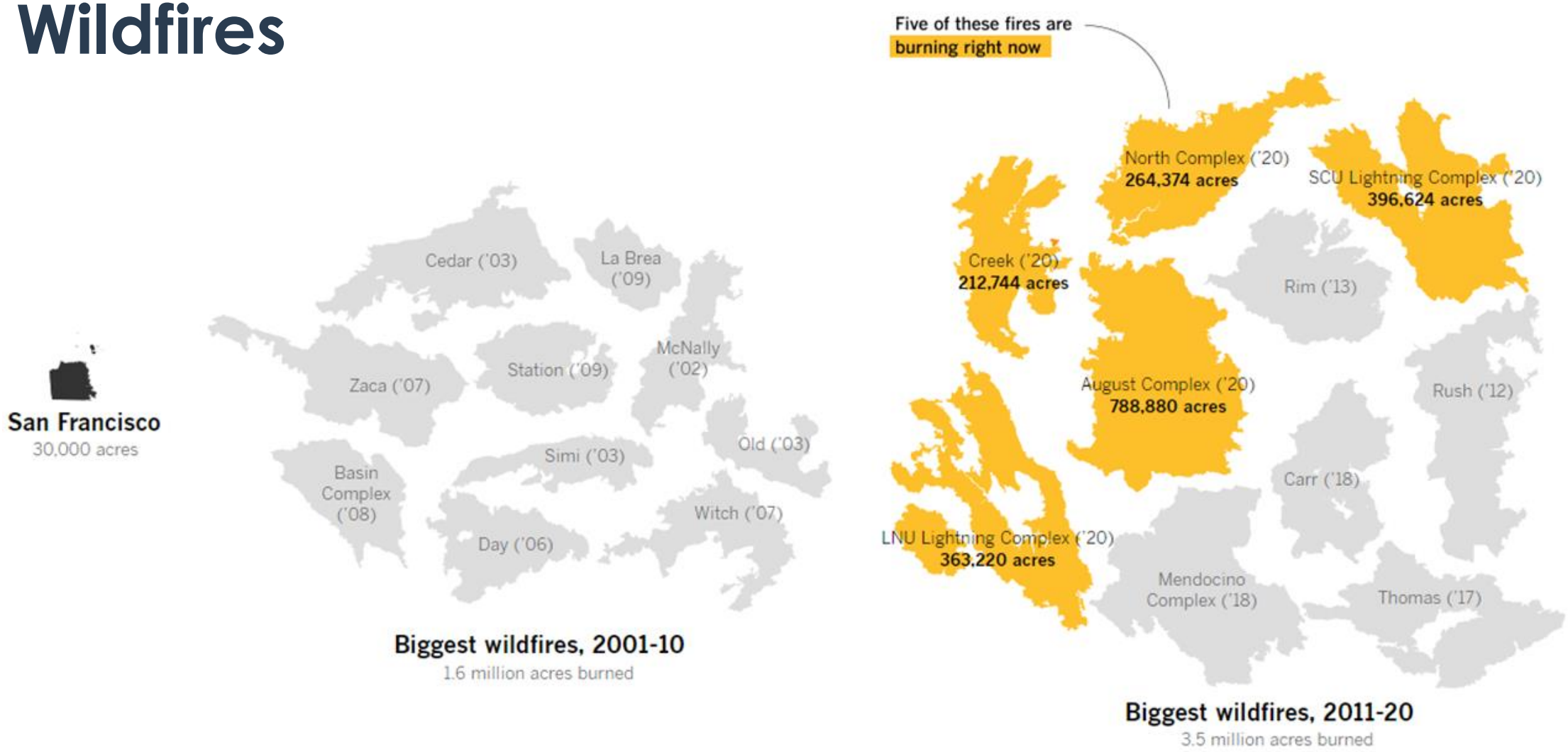
- meet in person with the impacted community

60 days

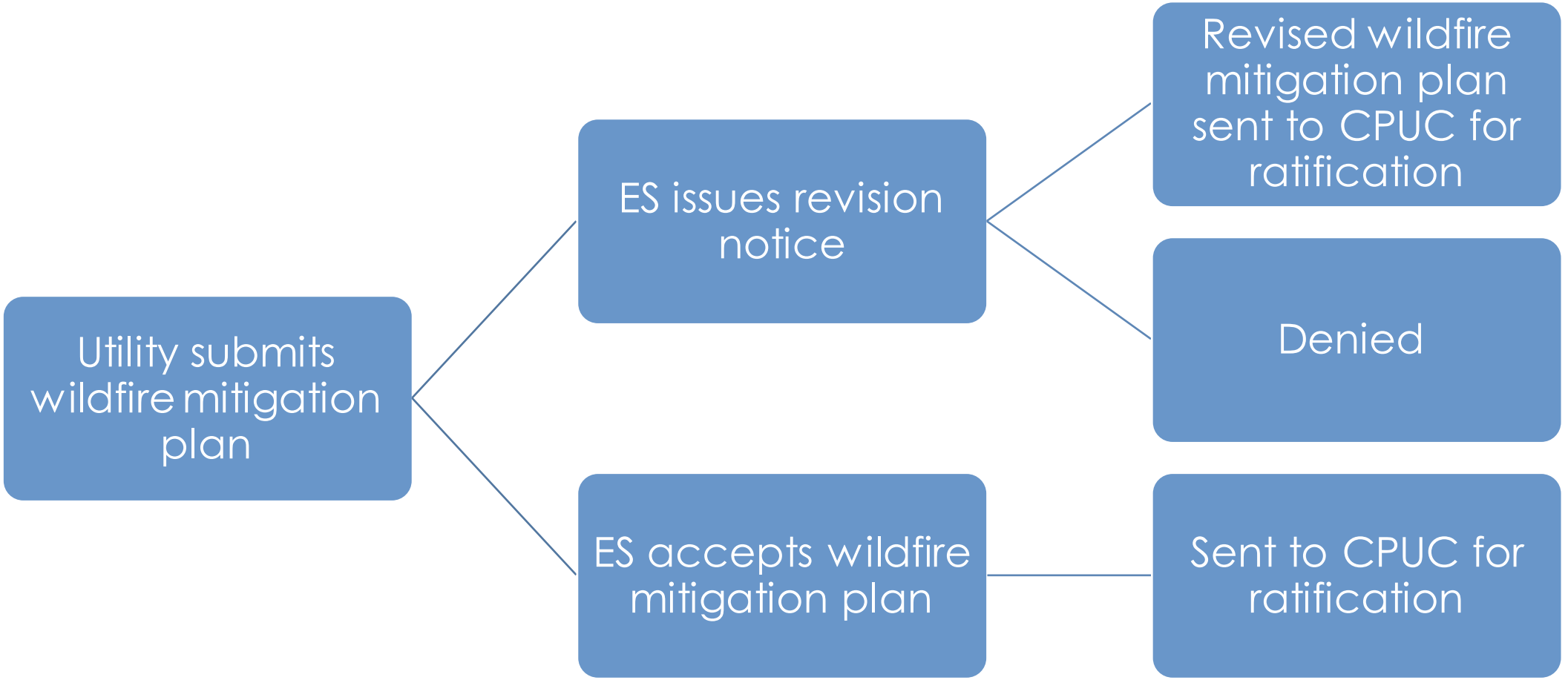
- 1. a summary of restoration and/or rebuild activities
- 2. a summary of the meetings
- 3. a summary of any changes made
- 4. a summary of any energy/communication infrastructure added or changed
- 5. other issues that caused delays

Wildfire/ PSPS

Increase in Record Breaking Wildfires



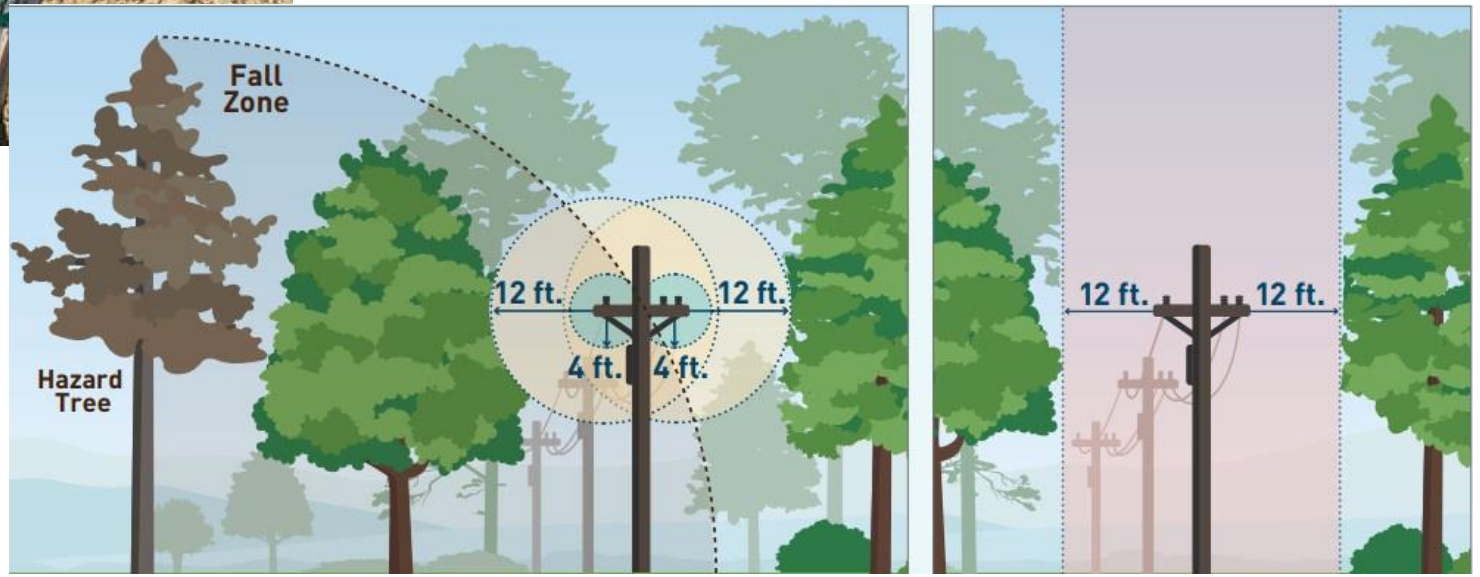
Wildfire Mitigation Plan Review Process



What's In a Wildfire Mitigation Plan?

Undergrounding overhead utility lines

Vegetation Management



Public Safety Power Shutoffs

- **Phase 1 PSPS Guidelines (2019)**
  - Customer notification and communications
  - Coordination with other agencies
  - Public education and outreach
  - Develop best practices

- **Phase 2 PSPS Guidelines (2020)**
  - Enhanced customer communications
  - Minimize impacts to customers
  - Increase accountability
  - Consider Access and Functional Needs Community

- **Phase 3 PSPS Guidelines (2021)**
  - Annual PSPS exercises
  - Additional advance notification
  - Increased services at community resource centers
  - Support for customers that rely on electricity to maintain necessary life functions
  - Conduct annual surveys of access and functional needs customers

Updating the DER Action Plan

New Wave of DERs in California

- **Electric Vehicles:** 5-8M EVs by 2030 = 250 GWh aggregate storage
  - ~ 4.5x utility-scale storage projected to be installed by 2030
- **Building decarbonization**: Substantial growth of smart, flexible end-uses
  - Smart devices & plugs
  - Smart thermostats/heat pumps
  - Smart electric (heat pump) water heaters
- **Doubling of rooftop solar**: 20 GW by 2030
- **3.5x growth in BTM storage**: 5.5 GWh storage capacity by 2030
- Growth of **microgrids** and other flexible emerging end uses

Updating the DER Action Plan

The CPUC released a draft DER Action Plan 2.0 in July of this year and is aiming to finalize the plan by early 2022.

DER Action Plan 2.0 Overarching Vision

- DER deployment is integral to achieving a 100% clean energy future.
- The CPUC continuously explores new policies, technologies, business models, and ideas to advance DER deployment in a manner that maximizes ratepayer and societal value and contributes to equity and affordability for all customers.
- The CPUC is committed to ensuring that DER policy is harmonized with CPUC policy directives related to safety, reliability, affordability, equity and environmental stewardship, including, but not limited to tribal consultation and engagement with disadvantaged communities
- Collaboration with other agencies (e.g., CEC, CARB, CAISO) and stakeholders is critical to meet the objectives of the DER Action Plan 2.0.

DER ACTION PLAN 2.0
Structure and Initiatives List

TRACK ONE

Load Flexibility & Rates

- Net Energy Metering
- PG&E Day Ahead Hourly Real Time Pricing (DAHRTP) Rate and Pilot Application to Evaluate Customer Understanding and Supporting Technology
- SDG&E, PG&E and SCE GRC Phase 2
- Rate Design Applications for evaluating and implementing default residential TOU rate designs
- SDG&E Application for Approval of Electric Vehicle High Power (EV-HP) Charging Rate Application
- Load Flexibility Management, recommended by CPUC staff
- CEC's Load Management Standard

TRACK TWO

Grid Infrastructure

- High DER Grid Planning
- Streamlining Interconnection of Distributed Energy Resources and Improvements to Rule 21
- Microgrids
- PG&E, SCE and SDG&E General Rate Case Phase 1

TRACK THREE

Market Integration

- Resource Adequacy
- Successor Storage and/or Demand Response, as recommended by CPUC staff
- Streamlining Interconnection of Distributed Energy Resources and Improvements to Rule 21
- FERC Proceedings
- Potential CAISO Initiatives:
  - Energy Storage and Distributed Energy Resources,
  - Energy Storage Enhancements,
  - Hybrid Resources,
  - Transmission Planning Process,
  - Storage as a Transmission Asset,
  - Dispatch Enhancements

TRACK FOUR

DER Customer Programs

- Integrated Distributed Energy Resources
- Self-Generation Incentive Program
- Energy Efficiency
- Building Decarbonization
- Transportation Electrification
- Demand Response
- Net Energy Metering
- Energy Savings Assistance Program

Vision for New Load Flexibility Rulemaking

The CPUC is planning to issue a staff white paper and open a rulemaking that explores advanced rates and demand response strategies to effectuate *widespread load management*, and a *more robust, dynamic, transactive DER marketplace*.

Support long term electrification:

- Leverage more effective DR and retail rate design strategies

Support and accelerate California's clean energy goals:

- Better address grid issues associated with the growth of renewables, electrification, and DER adoption

Promote fair and secure compensation for DERs:

- Encourage mechanisms and automation technologies in an increasingly transactive bidirectional grid

Additional Resources on CPUC DER Initiatives

DER Action Plan

https://www.cpuc.ca.gov/about-cpuc/divisions/energy-division/der-action-plan

Load Flexibility Management

https://www.cpuc.ca.gov/industries-and-topics/electrical-energy/electric-costs/demand-response-dr/demand-response-workshops/advanced-der-and-demand-flexibility-management-workshop

California Public Utilities Commission

www.cpuc.ca.gov/about-cpuc/commissioners/page-content/profile-list/commissioner-darcie-houck