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Response from Sentient Energy- Docket No. 19-ERDD-01

Dear Dr Stoms:

Thank you for inviting us to participate in this Request for comments process. We are Sentient Energy are keen to respond in a timely fashion to Governor Newsom's N-05-19 Executive order to dramatically improve Grid Resilience in the State of CA by June 2019 Fire Season.
We are honored to be part of this conversation and welcome a chance to accelerate the collaborations and discussions around improved Ignition Prevention, Detection, and Fire Mitigation

Thank you

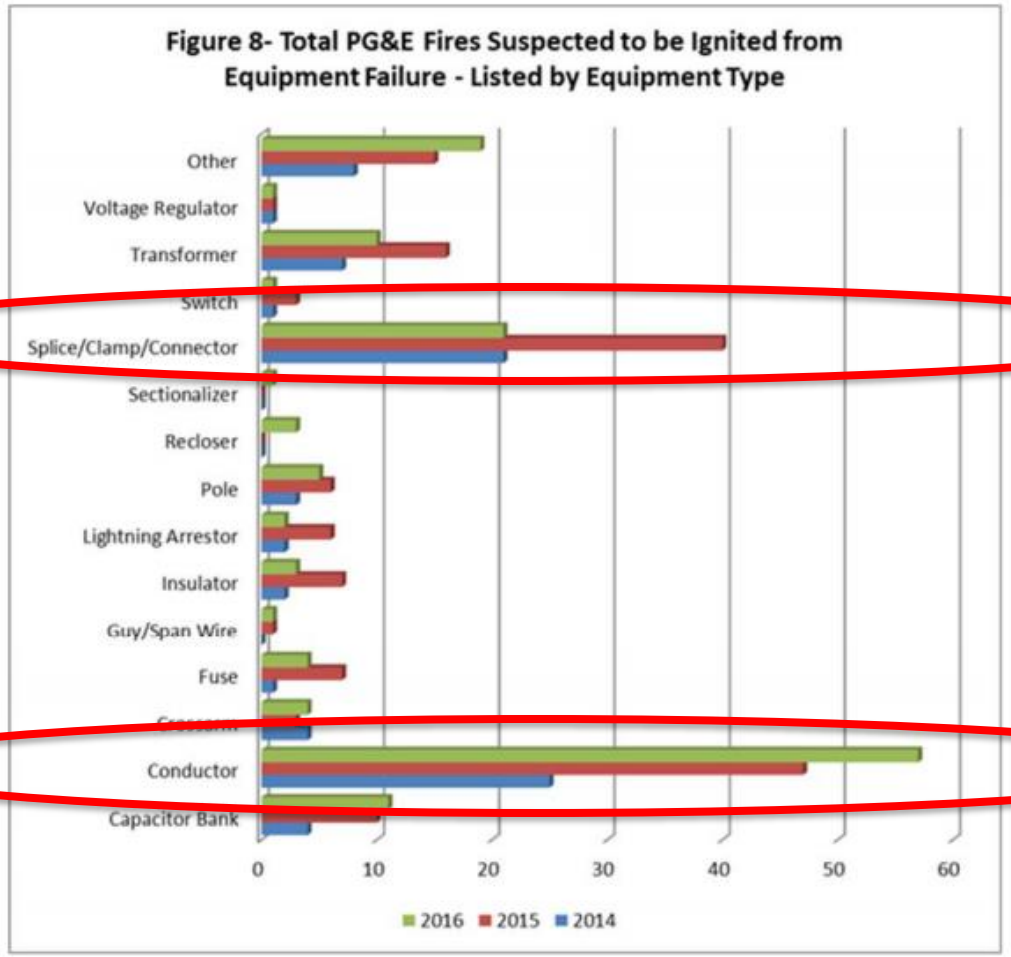
The Sentient Energy team

Additional submitted attachment is included below.

RESPONSE TO CEC EPIC DOCKET #19-ERDD-01
UTILITY SYSTEM IGNITION PREVENTION RESEARCH

MICHAEL BAUER, FOUNDER & PRESIDENT, SENTIENT ENERGY

EPIC grants should prioritize grants to research areas that are top drivers of fire



Source: Chris Parkes, CPUC 07.25.2018 presentation at CEC workshop

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Focus on pragmatic, applied research to meet the fierce urgency of now

- "Widening right-of-way far more cost effective due to revenue value of timber"
- " in Trinity county, it's not if fire now, but about when and how big?"
- "In rural CA, de-energizing standards need to be really high
  - Deenergizing means cutting power to the water pump (the source of water here)"
  - "high temperature and low humidity is 3 months of the year, so our customers will not accept that level of power outage"

Paul Hauser, General Manager Trinity PUD, 07-25-2018 presentation at CEC Workshop

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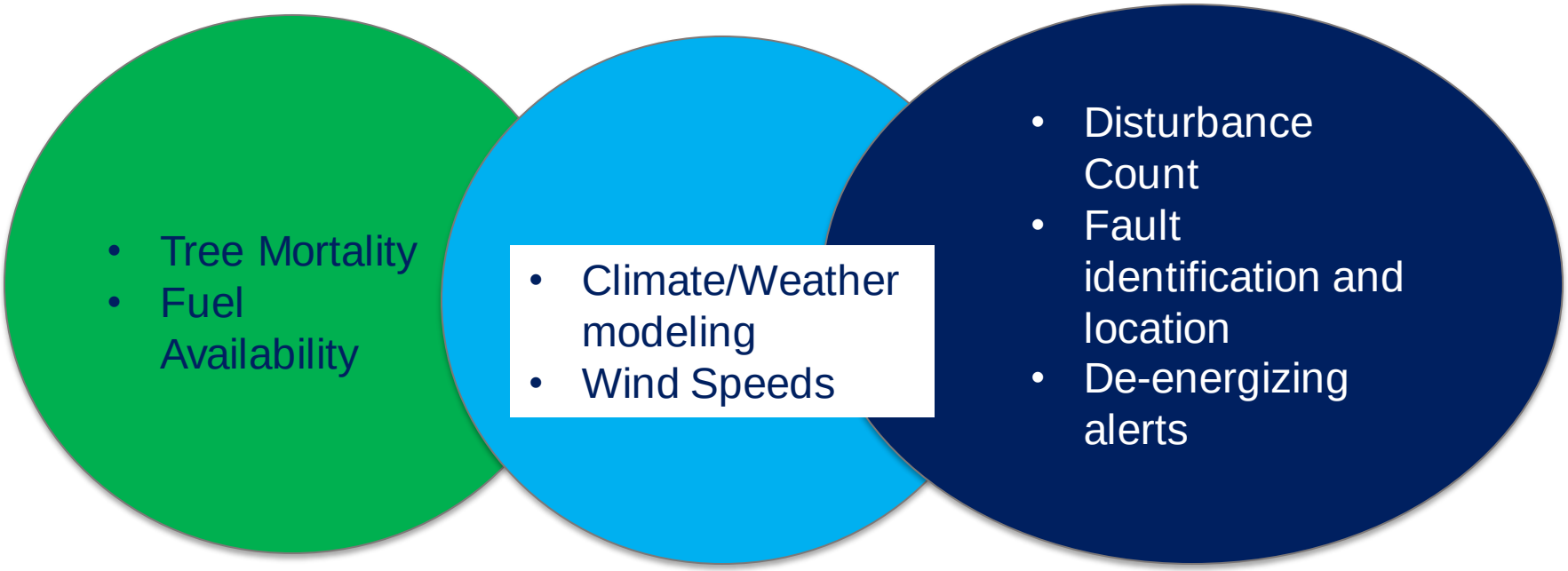
Pragmatic WildFire Prediction Modeling Approach from Sentient



E-Field Vegetation Intrusion Detection is high value and a pragmatic choice

Number	Category	Sentient Energy comments	What's available today	Where can EPIC grants help
1	Technologies/approaches to prevent equipment failure			
	E-field detection of vegetation intrusion on power lines	Can develop AI algorithms based on fast-deployable MV sensors that **count disturbances by feeder and segment today**; momentaries, transients and faults	• **Available now**: MV Sensors with disturbance counts/feeder/segment that point to vegetation intrusions-	EPIC grant can accelerate creation and tuning of AI/ML vegetation intrusion signatures based on waveform/oscillography data analysis
	Deployed at New Braunfels Utility (NBU) already	Correctly identified vegetation intrusion on two phases saving outage for 880 customers and improving SAIDI by 2.66 minutes		CEC EPIC can **accelerate analytical collaboration** with PG&E, SCE, SDG&E and other public utilities in CA

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Sensors/algorithms that monitor line sway, slaps and drops are critical to safety

Number	Category	Sentient Energy comments	What's available today	Where can EPIC grant help
1	Technologies/approaches to prevent equipment failure			
	• Sensors that identify environmental conditions that cause failure (e.g.- slapping behavior in windy conditions) • Devices that identify hot spots and loose connections • Devices to assess the conditions of lines and splices	Wind direction and speed are very indicate, but not always predictive. Conductor sway, conductor slap, arcing can be higher value if detected using line MV sensors	**Available now:** Our MV sensors have in-built accelerometers that can monitor conductor movement which is more valuable than wind speed and direction change. This will be built out in 2019	• EPIC grant can **accelerate creation and tuning of AI/ML algorithms** that measure conductor movement/ slap based on waveform/oscillography data analysis

Sensors/algorithms that pinpoint faults and location are critical to safety

Number	Category	Sentient Energy comments	What's available today	Where can Epic grant help
2	Technologies and approaches that identify fault types and locations and/or that take immediate action after a fault			
	• Devices that improve fault detection and location	Location accuracy algorithms can accelerate de-energization crews	**Available now**	Can guide precise de-energization especially in HFTD areas
	• Devices that are fast-acting t cut power to falling conductors	Accurate de-energization alerts to SCADA/ADMS systems and/or to mobilize crews	**Available now**	Need significant investment in sectionalizers/switches/ circuit breakers, etc. beyond sub-station into feeders

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Combining climate and grid algorithms are critical to safety and useful to first responders

Number	Category	Sentient Energy comments	Where can EPIC grant help?
2	Analytical approaches that make the greatest use of existing data to reduce ignition potential, such as taking advantage of satellite, drone and weather data to predict high risk areas for utility system ignition	**Needs research:** We are looking at using SDG&E FPI model. We want to add grid data on top of the FPI model; let the arborists and the meteorologists continue to improve underlying climate change and tree mortality models.	SDG&E FPI model while specific to SDG&E region can be applied and tailored to other parts of California where climate, trees, topology, weather, all differ. We **need accelerated collaboration** with PG&E, SCE, SDG&E and local public utilities

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Level of EPIC funding needed

- We think $5M/year for each of the the next 3 years would really help build, test, tune and validate improved wildfire prevention safety for the State of California especially when wildfire prediction models are tied to grid planning and operations at the IOUs
- CA utilities must dramatically increase level of MV sensor penetration on their circuits quickly, especially in the HFTD regions

Sentient ENERGY

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