# Wildfire Prevention by De-energization (PSPS)

# Problem Owner Details

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| --- | --- | --- |
| Role | Expectations (do not edit) | Mail IDs |
| Problem Owner | Who has identified and elaborated the problem | Rajeshwari\_Ganesan |
| Account, if any | If it is relevant to a specific account, please mention | All Utilities Accounts |
| Mentors | Technical team who will be able to provide clarifications on the problem, define the score and guide the hackathon participants on the solution approach | Rajeshwari\_Ganesan |

# Problem Description

# Business Context (Describe the problem and its impact)

Due to global warming, wildfire incidents are rapidly increasing. One of the key reasons for this also Electric grid faults, especially in California region with high winds and low humidity. The utilities companies in these situations resort to proactive de-energization of equipment, this is also referred to as PSPS (public safety power shut offs). Such power shutoffs impact customers who experience power cuts to protect them from fires.

In summary, there is a big opportunity for us to address this problem. The scope of this *Makeathon* is to take some foundational problems in the area. Let us build an *ML/AI system which meteorologist can use to determine areas to shut-off, without jeopardizing wildfire risk.*

# Solution Features (Must Have, Good to Have, Optional)

You will be given *real-life datasets of historic de-energization incidents in California* due to high environment risk. This data will be from 3 different utility companies for the years 2017 - 2021. Each of these event reports will indicate the county, circuit name, date, environmental values from weather station.

Must Have – Phase 1

* You first challenge is to process all the historic data to make it ready for data analysis.
* You will then apply simple statistical analysis methods to summarize key finding. Let us say, months when these incidents are highest, or what is metric which influences the risk the most.
* Model the various factors which influence the decision on PSPS. Some of these factors will be quantitative, while others may be qualitative. You need to make the qualitative ones computable.

Good to Have – Phase 2

* You will be given a dump of 160,000 records. You will need to present the high-risk data points which will need meteorologist can review in 4 hours.

Optional - Reference

* Public Safety Power Shutoff (PSPS) / De-Energization <https://www.cpuc.ca.gov/psps/>

# Relevance (How/where will the solution be utilized?)

Three large and several smaller utility companies have pledged to spend a combined $13 billion toward wildfire mitigation and prevention. Today the utility companies subscribe to several weather services to get granular data, in addition they have many visualization/simulation tools. There are also in-house meteorologists, who grapple with lots of data from analyzing the weather station data. Any miss can result in serious consequence to existence of the utility companies. Fire related liabilities has in past caused companies to file for bankruptcies.

# Software Required, if any (Mention suggested technologies to be used)

# Phase 1. Code in Jupyter notebook would also be sufficient.

* Phase 2. You will be given a VM loaded with data.

# Hardware Required, if any (will need to be funded by the account)

Will be provided for Phase 2.

# How to test (How can the solution be tested and what will be expected in the demo)

# Input datasets (Problem Owner needs to share the datasets relevant to the problem)

**2021 Utility Company PSPS Post Event Reports**

**PG&E** [Jan. 19, 2021: PSPS Post Event Report](https://www.cpuc.ca.gov/uploadedFiles/CPUCWebsite/Content/News_Room/NewsUpdates/2021/Jan.%2019,%202021%20PGE%20Post%20Event%20Report.pdf)

**SCE** [Jan. 12-21, 2021: PSPS Post Event Report](https://www.cpuc.ca.gov/uploadedFiles/CPUCWebsite/Content/News_Room/NewsUpdates/2021/Jan.%2012-21,%202021%20SCE%20PSPS%20Post%20Event%20Report.pdf)

**SDG&E** [Jan. 14-16, 2021: PSPS Post Event Report](https://www.cpuc.ca.gov/uploadedFiles/CPUCWebsite/Content/News_Room/NewsUpdates/2021/Jan.%2014-16,%202021%20SDGE%20PSPS%20Post%20Event%20Report.pdf)

[**2020 Utility Company PSPS Post Event Reports**](https://www.cpuc.ca.gov/general.aspx?id=6442467662)

[**2019 Utility Company PSPS Post Event Reports**](https://www.cpuc.ca.gov/general.aspx?id=6442466222)

[**2018 Utility Company PSPS Post Event Reports**](https://www.cpuc.ca.gov/general.aspx?id=6442466223)

[**2017 Utility Company PSPS Post Event Reports**](https://www.cpuc.ca.gov/general.aspx?id=6442466224)

# Evaluation Criteria (Add other solution specific parameters that will be measured to judge the solution)

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| --- | --- | --- | --- |
| Creativity | How creative or innovative is the idea within the given challenge? Has this been done before, or is this something completely new and original idea (architecture, design and implementation)? | 20% |  |
| Innovative Technology & Quality | How you have utilized the existing technologies to their solution and quality of code? | 10% |  |
| User experience and functionality | Is the overall user experience intuitive? Does the flow make sense? | 20% |  |
| Simplicity | How elegantly does it solve the problem (smart vs harder)? | 10% |  |
| Feasibility/Impact/Reuse/Extensibility/ Modularity | Does your solution work? Can it be implemented at scale? Can it be extended to other similar problem statements? | 10% |  |
| Progress and Execution | How much accomplish in a day? | 15% |  |
| Demo & Presentation | How well did the team present? | 15% |  |