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Comments on Draft Solicitation Wildfire: Assessing and Preparing for Risks under Climate Change

Additional submitted attachment is included below.

To: Docket Unit (docket@energy.ca.gov)
From: Larry Dale
Re: Comments on Draft Solicitation "Wildfire: Assessing and Preparing for Risks Under Climate Change"

Here are some of my research team's thoughts about promising new research into wildfire impacts on the California electricity grid. We focused on identifying existing grid vulnerabilities and options for building a more fire resistant grid.

1. Transmission Impact fires on ISO and Utility operations
    a. Expand study of impacts of wildfires on ISO operations including more about the frequency, impact and cost of wildfires that approach grid lines.
    b. We started a database of fires that approached transmission lines in California in the recent past. We matched this wildfire information with ISO information about grid impacts from these fires. This work could be expanded in at least three ways:
        i. Expand wildfire database (including fires in other regions, fires in earlier time periods).
        ii. Expand ISO survey of grid impacts. We obtained information from ISO about past grid impacts. Suggest that utilities be surveyed as well, to obtain more information about utility level impacts including: information about generation costs, maintenance costs, interruption costs and asset replacement costs.
        iii. Conduct more PLEXOS grid modeling studies to get a more representative estimate of grid costs associated with a wider range of wildfire locations, time periods and severity levels. .
2. Fire spread modeling inside the urban fringe
    a. There are many ways to model fire spread but first step will be to gather information about past fires to better explain the frequency and extent of fringe penetration.
        i. Frequency that past fires penetrated the urban fringe.
        ii. Characteristics of urban fringe cells that made them more or less susceptible to fires including
            1. Compactness of urban fringe
                a. Number of surrounding wild land cells
            2. Housing density of fringe cell
            3. Vegetation of fringe cell
            4. Vegetation of wild land cell.
    b. This information will help determine how best to model fire spreading into fringe areas. Modeling options range from simple tabular analysis to highly complicated dynamic modeling.
        i. Given time, we were considering a stepwise discrete choice statistical analysis, using the data to work out the probability

of a fire spreading across fringe cells as a function of fringe cell characteristics. Obviously, other approaches will work as well, but this one is an obvious candidate.

3. Fire Adaptation studies
    a. Fire resistant transmission
        i. Locate paths that should be undergrounded or relocated.
            1. Locate the most vulnerable paths to future wildfire damages.
            2. Work with utilities (and ISO) to estimates of the cost undergrounding these paths
            3. Work with utilities and CAISO to determine the benefits of undergrounding (cost of transmission interruptions.
    b. Fire Resistant WUI cells.
        i. This is a natural extension of the fire spread modeling work. That work should help identify characteristics of WUI cells that successfully warded off past fires in nearby cells.
        ii. This information coupled with in depth discussions with fire agency and utility representatives will help guide future planning to make WUI cells more resistant to future fires.
        iii. The work could be expanded to include more detailed information about the type of buildings in WUI cells that resisted past fires.
        iv. This work should also be expanded to help identify differences in the value of these cells, including cells, and portions of cells that hold particularly vulnerable and important grid and other assets (hospitals, government centers, etc.)
    c. Fire Resilient Landscapes
        i. Obviously, similar work is needed to help identify fire resistant landscapes and landscape treatments (e.g., controlled burns, forest thinning, irrigation).
4. Study Integration Issues (Transmission caused fires; Fire Model Aggregation Uncertainty)
    a. Transmission caused wildfires. The above studies are focused on the impact of wildfires to the grid. It bears repeating that the grid itself impacts wildfires. We understand that there are good reasons for separating studies of fire impact to grid, from grid impacts to fires. Nevertheless, many grid resilience options such as undergrounding will provide benefits that can only be counted by integrating these two types of studies.
    b. Blended wildfire model projections. Wildfire models as now constructed provide wildfire projections based on many variables including changes in:
        i. population (ignition probability)
        ii. fuel loading (biomass management and growth)
        iii. global emission related
            1. precipitation

2. warming
3. wind speed

iv. Non- global emission related
1. precipitation
2. warming
3. wind speed

c. There is enough uncertainty about some of these variables (e.g., wind, precipitation), it would be helpful to see disaggregated projections that hold some variables constants in order to isolate the impact of other variables.
1. Isolating the impact of these variables this way can help identify the emphasis that should be given some adaption options over others. For example, if fuel loading contributes more to wildfire frequency than population growth, perhaps more importance be given forest thinning than urban growth controls.