To: Sarah Lana, Emergency Services Coordinator
From: Ben Paulos, Commissioner, Berkeley Energy Commission
Subject: Final Draft 2019 Local Hazard Mitigation Plan (LHMP)
Date: October 28, 2019

Dear Ms. Lana,

The Energy Commission was pleased to be able to submit comments to the draft LHMP earlier this year. I'll reattach those for your convenience.

Our comments focused on energy issues, and especially on the hazards of lost electricity service due to disasters. We suggested a number of activities the City could do to mitigate against such disasters by building on the substantial and growing base of distributed solar power generators, and the emerging market for distributed batteries. We talked about potential solutions for critical facilities, for homeowners and businesses.

The hazards of power outages are abundantly clear today, as 20,000-plus Berkeley homes and businesses have been shut down under PG&E's Public Safety Power Shutoff (PSPS) program. There is a likelihood that the shutoffs will lead people to deploy gas and diesel generators, and thus increase the risk of fire and carbon monoxide poisoning, both while in operation and in the future, as people store fuel in their garages and basements to power their generators.

We argued in our comments that the PSPS constitutes a "man made disaster," and should be addressed in the LHMP. But the Staff Response to our input (item U) did not address this point, nor did it address our third comment about enabling distributed energy resilience by building on the 700 distributed solar systems already in place in the city.

I see that on October 15 you made a thorough response to the Disaster and Fire Safety Commission (DFSC), which was very informative and provided valuable context for the process.* However, that response also did not address the Energy Commission's comments.

It did discuss undergrounding power lines. As we have seen from PG&E's actions and statements this month, spending $200 million on undergrounding lines in the Berkeley hills — let alone in much higher risk areas of the state — is much less likely to happen than continued PSPS episodes every fall for the next decade.

Earlier this month I got a short reply from our Commission secretary, Billi Romain, that the PSPS is out of scope for the LHMP:

Hi Ben – The shut off issue is very important and timely. The Local Hazard Mitigation Plan (LHMP) addresses power outage as a result of natural hazard occurrences, but deenergization is not in the scope. LHMPs address natural hazards (per the requirements of the Disaster Mitigation Act of 2000).

However, the plan itself says: "Although this plan is focused on natural hazards, four human-caused hazards of concern are also discussed: hazardous materials release, climate change, extreme heat events, and terrorism." (Page ES-3)

So I would like to reiterate our point that the LHMP should address the risks posed by the PSPS, and should include specific and actionable plans for increasing energy resilience. I would recommend adding an additional section on the PSPS, with a focus on:

1) Addressing the energy needs of "electricity dependent" people who rely on powered medical equipment

2) Installing resilient solar + battery systems on critical facilities (this is well-covered in the plan, through the City's participation in the EBCE project)

3) Planning for installation of solar + battery stoplights and streetlights along evacuation routes and at high-priority intersections

4) Developing policies to incorporate energy resilience into neighborhood emergency planning (such as through the CERTs program) by building on existing distributed solar installations

5) Develop solar permitting policies that encourage or require the use of islandable solar inverters that can supply AC power with or without batteries

6) Educate the public on the risks of gas and diesel generators, the risk of storing fuel, and the benefits of resilient solar systems

I have to believe the PSPS will be putting this issue at the front of mind of many council members. The Energy Commission is meeting December 4, just before the LHMP goes to Council. I would like to see further change to the LHMP made before then. If the plan doesn't do more to address energy issues, I will move at the meeting that we vote to reject the LHMP in its current form.

Thank you for your work on the LHMP and in making Berkeley more secure. I hope we can extend that vigilance to the energy aspects of resilience.

- Ben Paulos

* I would recommend you post your response to the DFSC on the /mitigation website. Also, by the way, your document titled "Public Comments and Staff Responses" to the LHMP includes only staff responses; I could not find public comments posted anywhere on the City's website.

Comments on draft of the Berkeley Local Hazard Mitigation Plan (LHMP)

Approved by the Berkeley Energy Commission on February 27, 2019

On January 23, the Berkeley Energy Commission was briefed on the draft of the Berkeley Local Hazard Mitigation Plan (LHMP).

While the Plan was thorough and thoughtful, we think the energy-related parts of it could be improved in a number of ways.

1. The Hazard of De-energization

To reduce the chance of causing wildfires, California utilities have instigated a policy of "Public Safety Power Shutoff" or de-energizing certain power lines when conditions are dry and windy. Last year's Camp Fire and the set of fires around Santa Rosa in 2017 are all suspected of being caused by electric wires, owned either by PG&E or private owners.

The California Public Utilities Commission (CPUC) convened two workshops in December and January to consider the implications of the policy for vulnerable populations and emergency response agencies. People who are vulnerable to the impacts of a power outage are dependent on electrical medical equipment to maintain their health or even their life, are unable to rapidly evacuate their home, or whose health and safety is otherwise at risk due to loss of power.

As one disability advocate said at the workshop, "When you shut off power you are creating an emergency for large parts of the community."

Since the risk of wildfires is expected to grow due to climate change, and since many other options for mitigation are expensive or impractical, utilities are likely to continue to rely on de-energization, and potentially more frequently than in the past. Berkeley, with an extensive wildland-urban interface in the hills, is at risk for such shutoffs, which could affect the entire city.

As a result, the Energy Commission believes that de-energization should be added as a man-made hazard that should be addressed in the LHMP. Moreover, we believe that the risk of de-energization be considered "high priority," since it is as likely to pose a hazard as other hazards that are considered high-priority, such as tsunami and flooding.

2. Backup Power for Critical Facilities

The LHMP identifies the need for critical facilities, such as fire and police stations, call centers, and emergency shelters, to have sufficient backup power supplies in event of a prolonged grid outage.

The City has inventoried the energy needs of 48 City facilities that support emergency operations, and undertook the Berkeley Energy Assurance Transformation (BEAT) project, to look at creating a microgrid system on the Center Street Garage, that would power nearby City facilities during an outage.

The BEAT study showed "that solar + storage at singular facilities is more feasible than a microgrid. OESD is now seeking to identify potential financing opportunities to expand this solution beyond downtown. OESD will also evaluate solar + storage options at critical facilities."

East Bay Community Energy (EBCE) was recently awarded a grant by the Bay Area Air Quality Management District (BAAQMD) to work with EBCE communities to develop "resilient solar" strategies for critical facilities. Identifying facilities and funding strategies will be key parts of that project.

The Commission encourages the City to participate in the EBCE Resilient Solar project, to quickly identify facilities that are likely to be good candidates for solar + storage, and to pursue City bond, state and federal, and private third-party financing opportunities for rapid deployment.

The City should also engage with the Berkeley Unified School District, since schools are often used as emergency shelters and are typically well-suited for solar + storage, due to their large roofs relative to building load. Some Berkeley schools already have solar, though none have storage systems. There is potential for solar and storage at all schools.

3. Enable Low-Cost Islanding Capability for Distributed Solar

The second goal of the LHMP is that "The City will establish and maintain incentive programs and standards to encourage local residents and businesses to upgrade the hazard resistance of their own properties." (page ES-12)

Much of the discussion on this topic rightly focuses on reducing the risk of earthquake damage to homes and businesses.

But it does not discuss the potential mitigation during power outages that could be provided by the many rooftop solar systems that have been installed in Berkeley. According to CPUC data, Berkeley residents and businesses have installed about 700 solar systems, with a total generation capacity of 3.8 megawatts.

As the Plan notes, in the section on Exposure and Vulnerability, "Grid-tied photovoltaic (solar) panels are reliant on the electric grid being functional unless they are designed with smart inverters and battery back-up storage so that they can island from the grid." (page B-64)

An unknown, but presumably very small number of battery storage systems have been installed in Berkeley. Thus, in the event of a power outage, the 700 solar systems will not be able to provide any power to residents, wasting an opportunity to increase the hazard resistance of properties.

While batteries can provide islanding capability, batteries are an expensive option with a poor financial return for residential customers. They are unlikely to be commonly adopted in homes until the price drops significantly.

A more cost-effective, though limited, option is a solar inverter with an AC outlet, such as the SMA "secure power supply" inverter. Such an inverter is able to island from the grid and provide AC power only when there is sufficient sunlight to power the PV panels. Despite this shortcoming, it would be able to supply hours of electricity to refrigerators, cell phones, flashlights, and other critical appliances that would be plugged into the inverter directly. And it is a very low cost option, costing about the same as conventional inverters. In other words, it is essentially free, distributed energy resilience.

The City should educate local solar installers and Community Emergency Response Teams (CERTs) to encourage residential solar customers to choose secure power supply inverters. It should also consider making such inverters required as part of the local solar installation code, or to provide financial incentives for any marginal cost.