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Additional submitted attachment is included below.

California Energy Commission
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Commissioners

I attended both the May 29 and June 3 public meetings about the Compass Energy Storage Project proposed in San Juan Capistrano, and my comments are based on what I heard at those meetings. I am a retired scientist – biochemistry and virology – and I live at the north end of San Clemente close to the proposed site of this project.

I believe we are being misled by the project's promoters, and the safety issues are much greater than they have indicated. Here are some of the things they said (in Italics) and didn't say:

"Lithium-iron-phosphate (LFP) battery fires do not emit embers and are typically isolated to the individual battery cabinet." But when they burn they can emit toxic gases and jet flames, and the rise in heat can result in potential explosions in all neighboring battery units.

"Batteries are in solid state and placed in individually, hermetically sealed [steel] cabinets" But the process of energy production by these batteries causes the emission of gases which, if confined, can result in an explosion. Thus hermetic sealing can worsen the risks.

"Operates emissions free." Simply not true – see below

There was an overall implication that lithium-iron-phosphate (LFP) batteries represent the latest and greatest, state-of-the-art technology, but that's not true. LFP batteries have been around since 1996. They have a lower energy density than other lithium batteries and supposedly a better safety profile, but one source said that they can be more prone to explosions than other battery types if they fail. What is rarely discussed about these batteries, however, is the gases they produce.

A quick Google search came up with this:

LFP batteries produce various gases during their lifespan and especially during thermal runaway events. While they may produce less gas overall compared to lithium ion batteries, the gases they produce can still be flammable and toxic.

> Flammable gases include CO, methane, ethylene, and ethane
> Toxic gases include hydrogen fluoride, hydrogen cyanide and other electrolyte breakdown products
> Volatile organic compounds include ethylene, propylene, acetylene and 1,3 butadiene

I did some research and found a 2024 meta-analysis of studies of gas emissions of lithium ion batteries of a variety of types and chemistries. The important information provided is that LFP batteries produce on average about 25% of the gas emissions that NMC batteries produce, but the gases produced by LFP batteries tend to be more toxic and flammable.

I've summarized some of the points the authors made here.

Reference

Review of gas emissions from lithium-ion battery thermal runaway failure — Considering toxic and flammable compounds by Bugryniec et al in Journal of Energy Storage 15 May 2024. (https://www.sciencedirect.com/science/article/pii/S2352152X24008739.)

Excerpts: Common cell chemistries include **lithium iron phosphate (LFP)**, lithium nickel manganese oxide (NMC), and others. Generally, NMC is used as a high-energy cell, while LFP cells have a lower specific energy capacity and a larger specific power capacity and longer life span.

"Thermal runaway (TR) involves the exothermic chemical decomposition of the battery cell materials leading to vast heat generation and temperature rise. This is accompanied by the generation of gasses from the decomposition process that can be flammable and toxic, and can lead to smoke, hot sparks and jet plumes ejected from the cell. Further, in a module or pack the heat from one cell can cause a cascading failure or propagation throughout the pack, increasing the overall hazard from failure.

"NMC batteries produce more off-gas than other chemistries: 519L/kWh compared with 126 L/kWh for LFP batteries. …While NMC batteries release more gas than LFP, **LFP batteries are significantly more toxic than NMC ones in absolute terms**. LFP batteries have greater H2 content while NMC batteries have a greater CO content….. **LFP presents a greater flammability** hazard."

These results suggest that the batteries that will be used at the Compass Energy Storage site are a substantial safety risk. They pose a risk of explosion due to the accumulation of flammable gases inside the containers and the risk of explosion due to rising temperatures outside the container. If a fire should start in the brush around the site, the temperature inside the batteries would rise, which might lead to thermal runaway.

Importantly, toxic and flammable gases will be produced continuously in small amounts during normal operation and larger amounts under rising temperature conditions.

I oppose this project based on its currently proposed location for safety reasons.

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