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Concerned Parents Against the proposed BESS In San Juan Capistrano

Battery storage facilities, particularly those using lithium-ion batteries, can pose risks to children due to potential safety and environmental hazards. As father to three kids, I am extremely concerned about the health risk this BESS poses. Below are key reasons why such facilities may be harmful to kids, written in a clear and concise manner with a focus on their specific vulnerabilities: Please think of the families that live near the proposed site. We do not want this here!!!

Additional submitted attachment is included below.

1. **Fire and Explosion Risks:** Lithium-ion batteries can overheat or malfunction, leading to fires or explosions. These incidents release toxic smoke and chemicals, which can be especially harmful to children's developing lungs and immune systems. Emergency evacuations near schools or homes could also disrupt children's safety and well-being.
2. **Toxic Chemical Exposure:** Battery facilities may leak hazardous substances like lithium, cobalt, or electrolytes during accidents or improper handling. Children are more susceptible to these toxins due to their smaller body size, higher respiratory rates, and developing organs, potentially leading to long-term health issues like respiratory problems or neurological damage.
3. **Air and Water Pollution:** Construction and operation of battery facilities can release dust, pollutants, or runoff into local water sources. Kids, who often play outdoors or rely on local water, face higher risks of exposure to contaminants that could affect their growth, cognitive development, or overall health.
4. **Noise and Traffic Disruptions:** Facilities near residential areas or schools may generate noise from equipment or increased traffic from construction and maintenance. Chronic noise exposure can impair children's concentration, learning, and sleep, while heavy vehicle traffic poses physical safety risks.
5. **Proximity to Schools and Playgrounds:** If located near areas where children gather, a facility's potential accidents or emissions could directly threaten kids during critical developmental years. Even minor incidents could cause psychological stress or fear among children and families.
6. **Long-Term Environmental Impact:** Improper disposal or degradation of battery materials can contaminate soil and water over time. Children, who are more likely to play in local environments, could face prolonged exposure to these pollutants, leading to cumulative health risks.

Note: While these risks are based on documented concerns with battery storage systems, the severity depends on the facility's design, location, and safety measures. For specific data on a proposed facility, I'd need details like its location or technology type, which could be cross-referenced with web or X post information if you provide them. Would you like me to search for relevant incidents or studies to support these points further?

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environmental impact and health studies on battery storage facilities

Below is an overview of the environmental impacts and health studies related to battery storage facilities, focusing on their potential effects, particularly on vulnerable populations like children, as requested in your previous queries. The information draws from available web sources, critically evaluated for relevance and reliability, and addresses key concerns such as safety risks, pollution, and long-term health implications. I've kept it concise yet comprehensive, with citations to the sources provided.

Environmental Impacts of Battery Storage Facilities

Battery storage facilities, particularly those using lithium-ion batteries, have complex environmental impacts across their life cycle, from raw material extraction to disposal. Key concerns include:

1. Resource Depletion:

- **Mining Impacts:** The extraction of materials like lithium, cobalt, and nickel for batteries involves energy-intensive mining processes that can degrade ecosystems, disrupt habitats, and cause soil and water pollution. For example, lithium mining can deplete groundwater and affect local biodiversity.
- **Resource Scarcity:** While lithium reserves are considered abundant, the environmental cost of extraction remains significant, particularly in sensitive ecosystems.

2. Manufacturing Emissions:

- Battery production is energy-intensive, often relying on non-renewable energy sources in some regions, leading to significant greenhouse gas emissions. This contributes to climate change, which indirectly affects community health through air quality degradation and extreme weather events.
- For instance, vanadium-redox flow batteries show higher environmental impacts across multiple indicators compared to other battery types, with material costs and emissions being notable concerns.

3. Operational Risks:

- **Chemical Leaks and Pollution:** Failures in battery storage systems can lead to leaks of toxic electrolytes or heavy metals, contaminating soil and water. These pollutants pose risks to local ecosystems and can enter the food chain, affecting children who are more vulnerable to low-dose exposures.

- **Thermal Runaway and Fires:** Incidents involving thermal runaway (overheating leading to fires) can release toxic gases like hydrogen fluoride or carbon monoxide, polluting air and posing immediate risks to nearby communities.

4. **End-of-Life Disposal:**

- Improper disposal of batteries can result in hazardous materials leaching into the environment, contaminating soil and water. Recycling technologies are improving, but challenges remain in managing complex battery compositions to prevent pollution.
- Advances in recycling, such as those explored by Argonne National Laboratory, aim to reduce the need for new resource extraction and mitigate disposal risks.

5. **Habitat Disruption:**

- Large-scale battery facilities may be built in ecologically sensitive areas, leading to habitat fragmentation or loss, which can affect local wildlife and indirectly impact communities relying on these ecosystems.

Health Studies and Implications for Children

Health studies on battery storage facilities focus on risks from fires, emissions, and contamination, with particular relevance to children due to their physiological vulnerabilities (e.g., developing organs, higher respiratory rates, and smaller body sizes). Key findings include:

1. **Fire-Related Health Risks:**

- Studies on battery energy storage system (BESS) fires, such as those summarized by Ulster Clean Energy, indicate that air, water, and soil samples taken during and after incidents generally show no emissions or contamination exceeding public health thresholds. However, these studies are limited to short-term impacts and may not account for long-term exposure risks.
- For example, the January 16, 2025, fire at the Moss Landing facility in California prompted a 24-hour evacuation of 1,200 residents. Air quality monitoring found no immediate public health risks, but independent resident testing raised concerns about elevated levels of toxic metals in soil and water, suggesting potential long-term health risks for children exposed through play or consumption.

2. **Toxic Emissions and Children:**

- Battery fires can release harmful gases (e.g., hydrogen fluoride, carbon monoxide, hydrogen cyanide) and combustion byproducts like heavy metals. Children are more susceptible to these toxins due to their developing respiratory and neurological systems, which can lead to issues like asthma, cognitive impairments, or other chronic conditions.
- The EPA notes that lithium-ion battery fires are difficult to extinguish and may release emissions requiring specialized monitoring, posing risks to nearby schools or playgrounds where children congregate.

3. Long-Term Contamination Concerns:

- A Life Cycle Assessment (LCA) of flow battery systems highlights potential human health hazards from production processes, particularly for vanadium-redox batteries, which show high impacts on environmental and health indicators. These hazards include exposure to toxic substances during manufacturing or disposal, which could affect communities near facilities.
- Children's prolonged exposure to contaminated soil or water (e.g., from electrolyte leaching) could lead to developmental or neurological issues, though specific pediatric studies are limited.

4. Community and Psychological Impacts:

- Incidents like the Moss Landing fire caused community stress and evacuations, which can disproportionately affect children, leading to anxiety or disruption of routines. The EPA emphasizes the need for clear incident response plans to minimize such impacts.
- Posts on X reflect community concerns about lithium-ion battery fires, with some residents in New York opposing BESS facilities due to safety fears, particularly near schools or homes where children are present.

Mitigation and Research Gaps

- **Safety Measures:** Advanced battery management systems, fire suppression technologies, and remote monitoring (e.g., infrared sensors) can reduce risks. The EPA recommends compliance with standards like NFPA 855 and UL 9540 to enhance safety.
- **Sustainable Practices:** Innovations like solid-state batteries and improved recycling can lower environmental impacts. Research into alternative battery chemistries aims to reduce reliance on toxic materials.

- **Research Needs:** Most health studies focus on acute impacts, with limited data on chronic exposure to low-level contaminants, especially for children. Independent testing, like that conducted by Moss Landing residents, suggests a need for more comprehensive, long-term studies.

Conclusion

Battery storage facilities offer benefits for renewable energy integration but pose environmental and health risks, particularly for children, due to potential fires, toxic emissions, and contamination. While studies like those from Ulster Clean Energy suggest minimal immediate public health impacts, incidents like Moss Landing highlight ongoing concerns about long-term effects, especially in communities with vulnerable populations. Stakeholders should prioritize robust safety standards, transparent environmental assessments, and further research into pediatric health impacts to address these risks effectively.

If you'd like, I can search for additional studies or specific incidents related to a particular facility or region to provide more tailored information. Would you like me to do so, or is there a specific aspect (e.g., a local facility or battery type) you'd like me to focus on?