

Key Capture Energy - KCE IL 2

Battery Energy Storage FAQ

What is the risk of a fire at battery energy storage facilities?

Fires at battery energy storage systems are extremely rare. KCE IL 2 will be monitored 24/7/365 and has multiple fail safes in place that can automatically shut off portions of the system (or the entire system) in real time if something isn't operating correctly. In the extremely unlikely event a fire were to occur, the system is designed to isolate and contain the fire to a single rack or container.

The batteries that are installed in battery energy storage systems must pass much more rigorous safety and fire tests than batteries in e-bikes or other consumer electronics. These include international and national fire testing and safety codes, namely the National Fire Protection Association (NFPA) 855 and Underwriter Laboratories (UL) 9540A related to fire and thermal events. KCE only works with manufacturers and vendors that meet these codes and standards.

The rate of fires at these facilities is extremely low and has decreased significantly in recent years. The chart to the right can help put the extreme rarity of these events in proper context.

Battery Safety

Various incident and accident rates

Accident / incident rate per 100,000 operating hours



Source: Federal Railroad Administration, National Transportation Safety Board, National Association of City Transportation Officials, BESS Failure Incident Database

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Are there toxic materials that could damage the air, water, or soil? What safety measures are in place to prevent or mitigate the impact?

We recognize the idea of a fire at this facility is a scary proposition, which is why we take every precaution to prevent fires in the first place. Testing has consistently found that the air quality impacts of a battery energy storage fire, in the extremely unlikely event one were to occur, are similar to a standard structural fire.

The emissions from a battery energy storage fire consist of smoke and gases similar to a standard structural fire or burning a bag of trash, which contains primarily plastics. For KCE's projects, we conduct detailed health risk assessments of such emissions including plume modeling that has shown the public health impacts of such plumes are not significant.

Additionally, recently released EPA BESS guidance states that after a recent fire event in California, "air quality monitoring and sampling occurred during and after the fire and found no risks to public health." Air quality monitoring of real-world incidents has consistently found that smoke and gases from these fires dissipate quickly and do not present a danger to the public, just like a standard structural fire.

All BESS installed today are equipped with systems that monitor every aspect of the BESS, including voltage, temperature, and a variety of other datapoints. This monitoring occurs in real-time 24/7/365, and is further reinforced by trained human operators who are monitoring the data remotely. Any time that the system detects operating conditions outside of normal, the system automatically adjusts or shuts down all or a portion of the project if needed. The trained human operators also have full autonomy to adjust or shut down all or a portion of a project if needed.

Are batteries safe? What codes and standards are in place?

Battery energy storage systems must pass rigorous safety testing and follow national industry codes and standards including the national electric code, international fire code and National Fire Protection Association (NFPA) standards.

All BESS are required to be compliant with NFPA 855, the National Fire Protection Association's (NFPA) Standard for the Installation of Stationary Energy Storage Systems. Adherence to NFPA 855 requires compliance with a variety of product-level standards published by the Underwriters Laboratories (UL), a global not-for-profit safety science company. UL standards apply to all components of the BESS, including battery cells, modules, racks, and containers. Prior to the project being installed, these UL standards require safety testing of the batteries and the protective systems, a review of the battery construction, an engineering analysis of potential failure modes, and large-scale failure testing to address the risks during a forced thermal event. NFPA 855 also requires fire department training, emergency response planning, and 24/7/365 monitoring of the system along with the owner or operator being able to provide a subject matter expert 24/7/365 in the case of emergency.

How will KCE ensure the fire department is able to respond to the BESS?

KCE has met with the Ramsey Fire Department and will continue to communicate with the fire department throughout the development and construction of the project and conduct training and education.

Additionally, an Emergency Response Plan will be finalized with the fire department prior to the project being built. KCE will also conduct a training with the fire department prior to the project coming online and will offer an annual training or as requested by the fire department once the facility has begun operations. KCE works closely with local officials during the project development process to answer any questions they may have regarding our operations and fire containment and response strategy. KCE's number one priority is safety, and we are proud of our safety record.

What is the benefit to local electric grid and the local community?

KCE IL 2 will help stabilize the electric grid for Fayette County and the surrounding area and reduce the threat of blackouts. Batteries are instantly dispatchable and can respond in real time to the needs of the grid. These systems also increase efficiency by storing renewable energy at times of low demand and dispatching that energy back to the grid when its needed most, allowing solar and wind energy to be used even when the sun isn't shining and the wind isn't blowing.

What battery chemistry will be included?

The project will use batteries of Lithium-Iron-Phosphate chemistry, or LFP for short. LFPs fall under the larger umbrella of the lithium-ion battery family. LFP batteries are industry standard and are widely used across the country in utility-scale BESS installations today. The batteries used in KCE's systems must pass much more rigorous safety and operational standards than batteries in e-bikes, laptops and other consumer products. This includes national and international fire association testing, specifically the UL 9540A test related to fire and thermal events.

What can you tell me about KCE's operating history?

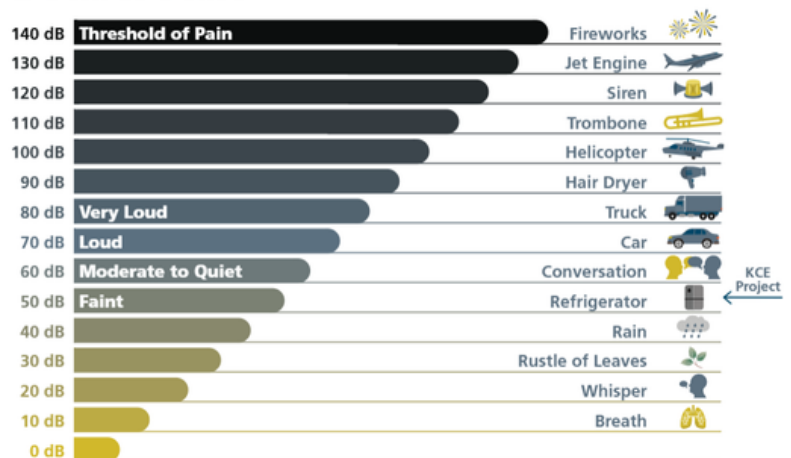
KCE is one of the country's most experienced BESS owners and operators with 14 facilities operating today, including several 100MW facilities- similar to the proposed KCE IL 2.

KCE has in-house operations and maintenance teams that ensure our operating facilities are well maintained to the highest standards. KCE's facilities are monitored 24/7/365 remotely and with cameras, which allows our team to respond in real time if something isn't operating correctly. KCE is proud of our operating and safety record across the country

I'm concerned about noise impacts. How loud will this project be?

Battery energy storage facilities are very quiet, typically 60 dB or less at the property line. The batteries in the system do not produce noise; the noise is mostly associated with the HVAC systems as well as electrical equipment like inverters and transformers. Since the project is located near an existing substation, any noise impacts will be very similar to the noise that is already being produced by the substation. Substations are typically in the 50-80 dBA range and the level is dependent on the substation size, voltage class, equipment configuration, how hard the substation is running, and where the equipment is situated relative to where someone is standing at the fenceline.

Decibel Scale



It's worth noting the substations and their associated transmission lines are universally a far greater noise annoyance to a community than a BESS, mostly due to high-voltage noise and low frequency hum associated with higher voltages. This is one of many reasons why KCE chooses to site our projects next to existing high voltage substations. The graphic below helps contextualize how a BESS system sounds compared with other common everyday products.

KCE IL 2 will also comply with the Illinois State Pollution Control Board noise standards, which are required by the County.

How will this project impact property values?

There have been limited peer reviewed studies on this specific issue, but a recent paper from the University of Pennsylvania Wharton School of Business evaluated 178 utility-scale BESS projects and found, “that houses near an operational utility-scale BESS project do not experience significant price changes compared to houses farther from the same project. The null result is robust across individual event studies, years from treatment, and census tracts with different socioeconomic characteristics.”

KCE has also commissioned its own study from a third-party firm, CohnReznick Advisory, that included research on property transactions adjacent to BESS sites and interviewed real estate professionals and assessors. The study found no negative impacts on adjacent property values based on location near a BESS site. Utility scale BESS projects do not reduce property values, especially when sited next to existing or planned substations, like KCE’s proposed project.

What is in the batteries, and does it pose a threat to drinking water or groundwater?

The following table provides additional information on the compounds that will be housed within the battery containers and associated equipment. The compounds and materials used in this equipment are generally similar to those found in electric generation, transmission, and substation infrastructure nationwide - with the primary exception being the battery electrolyte. The electrolyte is a key component that allows the batteries to charge and discharge by conducting ions between the positive and negative electrodes. LFP batteries do not contain heavy metals.

All operations will comply with local, state, and federal regulations regarding hazardous materials management.

Electrolyte	Unlike lead acid batteries, the electrolyte is not a tank-stored liquid. If released, it will evaporate into the air and quickly dissipate below detectable levels rather than spill or pool as a liquid.
Refrigerant	R513a or R-1234yf for use in commercial HVAC/chiller equipment to cool the batteries. These are common substances used in a variety of everyday cooling and refrigeration applications. R513a is typically stored as a pressurized fluid, existing as a combination of liquid and vapor, sealed within copper coils and components within the system. R-1234yf is a widely used refrigerant that is now the new standard for automotive air conditioning. Both refrigerants have low boiling points (approximately -29°C/ -20°F), which means they will instantly vaporize at typical atmospheric temperatures.
Coolant	50/50 mix of ethylene glycol and water for use by the chiller. This is a common substance used in residential and commercial HVAC systems.