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To the Chautauqua County Legislature, the Ripley City Council, the Ripley Fire Department and the people of Ripley and of Chautauqua County,

I am writing this letter to address a number of comments and concerns which have recently arisen regarding lithium-ion battery energy storage systems in your hometown.

Lithium ion batteries permeate nearly every facet of our lives. They are in the phones we carry in our pockets, in the laptops and tablets on our desks, in the toys our children play with, in the airplanes we fly on, in the medical devices that sometimes help keep us alive and increasingly in the vehicles we drive every day. Though some of these technologies have experienced issues with lithium ion batteries over the past two decades, these issues were typically limited to specific types of batteries in specific products, not unlike how a specific model of car may have a failure resulting in recall. With each of these incidents, we have learned how to make these products safer and better, and the world has benefited from this knowledge. In that time as well, the cost of this technology has dropped, and we now sit at a precipice in which energy storage technology will change the way we make energy, use energy, and ideally improve our lives in ways we can't fully fathom yet. And just like other revolutionary technologies which have changed the world, lithium ion batteries now carry a stigma which requires explanation.

Before I continue, it is worth noting that I am the son of a small town in southeastern Ohio, not at all unlike Ripley. I have also had the privilege of driving through Ripley and western New York dozens of times in the previous four years for work and pleasure related purposes. I understand the pride you have in your communities and the desire to protect them from outside influences which do not hold your interests or communities dear. Regrettably, even the renewable energy space has had its share of bad actors which have sought to push unsafe systems in unregulated markets, most recently the energy storage industry itself. It is a testament to the industry that in spite of this lack of regulation, more events have not occurred to date and system safety improved during that time because it was the right thing to do. However, the risk posed by many of these legacy systems, deployed prior to regulation, is one of the reasons I created Energy Storage Response Group. Creating better codes and standards, improving overall system safety, training the fire service to deal with energy storage, and helping communities and public safety officials like yourselves understand the actual risks posed by energy storage are several of the other reasons.

Prior to relocating to Columbus, I served as a volunteer fire fighter, and my father has served in various officer positions on the same department for over 45 years. I have several friends in that department and even more friends on fire departments across the country and across the globe. Both of my fellow co-founders are fire fighters, with one retired from FDNY and the other still active in a suburban department in Ohio. I am also proud to work with several other retired fire officers from around the country, all with the same purpose, to make energy storage safer and to ensure that the fire service can manage the rare incidents that may occur. To that end, we think of ourselves very much as a group of fire fighters for fire fighters, and we take that mantra seriously.

With that background, I wish to address several of the concerns that have been brought to our attention here just as we have addressed them in other communities throughout Western New York. To begin, it would be disingenuous on our parts to pretend that energy storage systems have not had safety incidents in the past. Though they have been rare in the US, looking around the globe, incidents in these types of systems have occurred several times in the previous four years throughout the world. However, these incidents, based on the number of systems deployed, have not occurred more regularly than many other similar safety incidents we have come to accept as part of our lives, and a large number of these incidents are centered in a part of the world with a very different regulatory environment than our own. Electric vehicles may make the news when a battery failure results in fire, but how many passenger vehicles, equipment, and other gas-powered devices have caught fire in a similar period of time without the same fanfare? As a matter of science, it is worth pointing out that the thermal energy contained in the fuel tank of the average passenger vehicle is actually far greater than that contained in a similar electric vehicle. It's not hard then to imagine reservations about gas powered cars when they first came about. Though easy to imagine the concerns of fire fighters when gas stations started popping up around the US, with proper safety regulations and codes, an incident at a gas station has become a rather benign event in many cases, and a rather attention drawing event when it does occur because of how rare it is. Energy storage systems following the codes in place today are the same, and while the fire service needs proper training for how to deal with such an event safely, this is an activity Energy Storage Response Group performs on a regular basis.

As a company focused on energy storage safety, we believe it is important to dispel the myths surrounding energy storage so that we can focus our attention fully on legitimate safety concerns, concerns which may exist in a unique combination to the fire service, but which in and of themselves are not unique given the risks fire fighters currently encounter on a daily basis. Rapid gas production, explosion risk, electrical risk, and reignition are all possibilities with these technologies. However, our focus on safety is on those issues, issues which the fire department deals with safely now from natural gas, electric utilities, and even basic structure fires. In many cases, it is worth pointing out that those hazards lack any form of protection and exist in our homes as we speak, whereas lithium ion battery systems require active and passive systems for monitoring, fire suppression, ventilation, and explosion protection.

Along with our fire service background, ESRG employs engineers, me among them, who have conducted hundreds of tests on lithium ion battery cells, modules and full-scale systems. In the course of this testing, we have seen the early, “wild west” like days of our industry, including systems which were genuinely dangerous. Over time, as product standards developed and the industry was forced to improve, we have seen that many of these same systems, with appropriate engineering, can be made safer and more manageable in the increasingly rare chance that failure does occur. In some cases, we have helped advise the manufacturers of these systems on how to improve safety, in many cases beyond what is even required by codes. To that end, we don’t just think lithium ion battery systems can be safer and more manageable, we know they can be, and we are proud to serve on the codes and standards committees writing the rules to do just that.

To address some of the concerns directly, please allow me to switch formats and consider the following frequently discussed topics:

Q: Lithium ion battery systems pose explosion risks with affected areas miles wide.

A: While lithium ion battery systems emit flammable gases, including hydrogen, during failure, these gases are typically contained within the battery enclosure. It is rare for these gases to be emitted at rates which would create a hazard even immediately outside the enclosure, and typically once an enclosure is opened up, the explosion risk diminishes in favor of a more steady state fire.

Unlike natural gas pipelines or other industrial fires which may have nearly limitless fuel sources, lithium ion battery fires will grow no larger than the affected system itself, as the fuel is finite. Under new product standards, spread of the fire should not even exceed the affected rack, and with active protection schemes may not even grow that large.

Along with these active protections, training for the fire service will include how to identify these conditions, how to interact with system operators to determine necessary safe distances, and how to manage these situations when they occur.

As a reference on affected areas, ESRG typically marks a safe zone for test observers at 50-75’ depending on the conditions of the test, which we control. For fire fighter safety, we may advise a safe zone just outside the fence line and upwind depending on smoke production, but rarely advise even the command post be placed more than a hundred or two hundred feet away, even for large utility scale systems.

Q: Lithium ion batteries are highly pollutive and will contaminate local land and water for years or more.

A: Lithium ion batteries contain a number of known substances including plastics, metals, and hydrocarbons. These batteries are incorporated into electrical systems which contain a number of other known substances, none of which are unique and many of which are likely found in the existing substation which sits next to the proposed BESS Site.

Work by DNV GL, as well as proprietary research conducted by ESRG and others, has shown that lithium ion battery fires produce a number of flammable gases during the initial failure, as well as trace hydrogen halide gases such as hydrogen chloride. Once the fire starts, which is required to involve more than a very small portion of the battery, production of the flammable gases gives way to production of typical combustion gases such as carbon monoxide and carbon dioxide. Production of hydrogen halide gases is then on par with, or in most cases lesser than, an equivalent amount of plastic as much of the batteries are actually metals like iron, aluminum, and copper. To that end, one cannot say a lithium ion battery fire is safe, as even the burning of pure organic material like wood produces adverse gases, but lithium ion battery fires, under conditions observed to date, have not produced toxic gases or substances more dangerous than any typical modern structure fire and do not merit any special response from the fire department. As for the quantity of gases released, a multi container system with appropriate spacing will ensure the maximum size of the fire is limited. Training will help the fire department understand how to monitor for gases with common firefighting or hazmat gas analyzers and how to use that information to assess conditions in and around the BESS.

ESRG's test facility is located outside a former municipal water treatment facility, and the city reservoir is located less than 100' from much of our testing. We are required to capture 100% of firefighting run off water, sample it and dispose of it accordingly. With few exceptions when other known substances have been present, nothing RCRA controlled has been detected coming from the batteries. As our water use is also sparing, it is simple for us to contain the water used and disposal is typically simple. For systems in the field, ESRG has worked with clients to understand environmental concerns and to protect sites accordingly. ESRG does this alongside their hazmat disposal partner and has performed this pre-planning for sites in environmentally sensitive areas. To date there has been no concern with a site that couldn't be easily remedied with simple water diverting and capturing devices during fire ground operations, and in worse case scenarios a simple top soil scrape was estimated to handle even the most extreme cases following an incident.

However, all of this is predicated on the occurrence of a large-scale incident which is believed to be rare. Without an incident, the ESS containers or cabinets will be trucked in, placed, and 20 years later trucked out with no lasting environmental remnants of their presence.

Further, as a fellow sportsman, concerns about impacts on hunting and wildlife are unfounded, and there is nothing, based on my knowledge of these systems, which would lead me to believe they would, either during normal operation or even following an event, pose any impact on local wildlife outside the fence

Q: There is no way to respond to emergencies with these systems safely, no current regulatory requirements, and no guidance from firefighting organizations or governing bodies as to how to handle these incidents.

A: NFPA has released training programs for energy storage safety for both electrical vehicles as well as stationary energy storage systems with PV. Other private organizations have been developing and deploying training materials for years, and UL, along with the IAFF, is currently developing yet another round of training materials and programs for the industry. While individual states have not developed training programs for ESS, they do not typically develop training programs or release guidance on any specific types of events or fires, as that responsibility typically falls on the owner/operator of such systems.

Further, New York State was actually the second state in the country (after California) to adopt ESS fire codes in the form of the draft 2021 International Fire Code which has become NYS Fire Code Section 608 and is the law of the land today. This code, based on NFPA 855, the Standard for the Installation of Stationary Energy Storage Systems, represents the industry's best efforts to date at developing an all-encompassing standard for the safe installation of these systems and is under constant revision to keep it in line with industry best practice and the state of the art of the technology. While NFPA 855 has not been published long enough to determine how effective it is, none of the systems that have caught fire around the globe to date would have passed the requirements of the standard when they were deployed.

In closing, there is a personal standard I consider when working with an ESS project which I think applies aptly here. At the end of each project, based on the project owner/operator, the overall safety of the system, and the training we provide to the fire service, I consider whether I would feel confident with this system being deployed in my hometown, knowing the impact it may have and that my friends and family may respond to the system. I am confident that when the time comes for ESS to be deployed in your beautiful part of the state, it can be done so safely, responded to safely, and in a manner which will pose no adverse or lasting effect on your community.

Thank you for your time and consideration,



Nick Warner

Principal, Co-Founder

Energy Storage Response Group