



King County

Docket Form King County Comprehensive Plan

Date	December 26, 2025		
I. Applicant Information			
Name <i>(if multiple, list all)</i>	(see p. 3)		
Property Address	N/A		
Phone	425-432-1332	Email	primbos@comcast.net
Council District	3 and 9		

II. Type of Request			
Comp. Plan Policy or Text Amendment		Land Use Designation Amendment	
Development Regulation Amendment	Yes	Zoning Classification Amendment	
Four to One Proposal		Other	
Has this been submitted previously?	No	If yes, please indicate the year	
If yes, what was the outcome?			

III. Amendments to Comprehensive Plan Policy or Text, or Development Regulations	
Introduction	(see p. 3)
Background	(see pp. 3 - 7.)
Requested Changes?	(see pp. 8 - 10.)
If addressed already in the plan or code, what change is needed?	(see pp. 8 - 10.)
Why is this amendment needed?	(see pp. 12 - 14.)
What are the expected or desired outcomes of this change?	(see p. 15.)
What are the potential positive or negative impacts of this change?	(see p. 15.)
How is this amendment consistent with the Growth Management Act?	(see p. 15.)
Conclusions and Recommendations	(see p. 16.)
Appendices	(see pp. 17 - 38)

IV. Amendments to Property Specific Land Use and Zoning			
General Location			
Total Acres			
Tax Parcel ID (if multiple, list all)			
Current Land Use Designation	<i>Click here</i>	Requested Land Use Designation Amendment	<i>Click here</i>
Current Zoning Classification	<i>Click here</i>	Requested Zoning Classification	<i>Click here</i>
Is there a Special District Overlay or Property Development Condition?			
Requested Change and Rationale			
Proposed Use of Parcel			
How will change affect adjoining parcels?			
How is change compatible with the surrounding area?			
Additional information?			

For property owner representatives:			
Name		Email	
Phone		Click to testify you have authorization to submit a docket for this property owner.	

How to Submit a Docket Form:

- Save the Form to your computer, fill it out, and then email it to: compplan@kingcounty.gov.
- Due to the covid pandemic, paper copies are not being accepted.

Background on King County Docket Process

The Docket process responds to the requirements of the Growth Management Act at 36.70A.470 and is codified at the King County Code Title 20.18.107 and .140. Docketing means compiling and maintain a list of suggested changes to the comprehensive plan or development regulations in a manner that ensures suggested changes are considered by the county and are available for review by the public. June 30 is the annual docket deadline. There is no fee for submitting the docket form. To download this form electronically or learn more about the Docket Process, visit: <http://www.kingcounty.gov/compplan/>

KCCP Docket Item Request

Introduction

The individuals below, listed in alphabetical order, are submitting the Docket Item Request herein.

Mike Birdsall, Hobart
Susan Boundy-Sanders, Magnolia
James DeLay, Covington
Serena Glover Woodinville
Jeff Guddat, Auburn
Patricia Gustafson, Woodinville
Susan Harvey, Ravensdale
Steve Hiester, Maple Valley

Don Huling, Auburn
Karen Meador, Auburn
Tim O'Brien, Cumberland
Peter Rimbos, Maple Valley
Michael Tanksley, Woodinville
Patricia Traub, Enumclaw
Greg Wingard, Covington
Toby Una, Ravensdale

Although we all are members of the King County *Joint Team of Urban and Rural Area Unincorporated Organizations*, we are making this submittal as individuals, as there simply was not sufficient time for the Joint Team organizations to vet, discuss, review, modify, vote, and approve.

In addition to providing all the information required on the *standard* Docket Item Request form, we have included four Appendices:

- Appendix A — Financial Liability** (p. 17)
- Appendix B — Government Actions on BESS Facilities** (pp. 18 - 22)
- Appendix C — Alternate Energy Storage Solutions** (pp. 23 - 24)
- Appendix D — References** (pp. 25 - 38)

Background

We understand use of a Battery Energy Storage Systems (BESS) facility is one of the ways that can be used to store energy for later use, especially that from renewable sources, such as Wind and Solar, which are intermittent energy generators. Because of these reasons, we support the judicial use and siting of BESS facilities. We also understand that siting of such facilities must be informed by what each site offers and does not offer. In general, a prospective site makes most sense when coupled with energy systems and needed infrastructure/capabilities, such as fire fighting, hazardous materials handling, emergency response, etc., already exist.

We see three potential applicants for *commercial-scale* BESS facilities: (1) Power utilities for use in conjunction with Wind and Solar, as well as to improve stability, and making the grid more resilient; (2) High-electric-use industries for use as back-up, or paired with co-generation; and (3) Speculators seeking relatively inexpensive land (rural) to leverage as much cash out of the deal as possible. We consider potential applicants for BESS facilities listed in (1) and (2) above as legitimate. We consider those in (3) as not and, thus, the most problematic. To be clear, we see no problems with *residential-scale* BESS as an accessory use with net metering by a local utility.

Given the State's goals for capacity for *commercial-scale* BESS, it appears there is no need for them to be placed in the Rural Area. In fact, King County can more than meet the capacity goals by limiting BESS facilities to industrial areas. It is in those areas where all the needed safety and response training and capabilities already exist. Hazardous materials events, such as metal fires,

require specialized knowledge and equipment, especially with potential releases of toxic gases with Lithium battery fires.

Again, State goals for total storage can be met in King County by co-locating *commercial-scale* BESS facilities with large electricity users in the industrial zoned areas. The benefits are many, the company themselves can benefit from using the stored electricity to augment or power their operations during peak use times when electricity costs are high, and in the case of grid brown outs or blackouts, the capacity can be directed to stabilizing the grid. Such sites allow for multiple benefits: Uses land already zoned industrial, Takes advantage of existing robust plans for hazardous materials response, and has Fire Departments that are better trained and equipped to potential emergencies.

Los Alamos National Laboratories has concluded that Li BESS only should be allowed in heavy industrial zones, where a fire and/or evacuation contamination events could be adequately managed and not cause safety concerns to many people ("*Lithium-ion Battery Safety Issues for Electric and Stationary Applications*," Los Alamos National Laboratory, 2019).

However, we recognize there are issues related to equity and social/environmental justice in placing a high proportion of *commercial-scale* BESS facilities in the industrial areas where many marginalized communities, historically and currently, have experienced higher levels of impacts from toxic exposures than surrounding, better-off communities. Such considerations must be taken into account.

In the Rural Area, there may be instances where there could be benefits from *co-locating commercial-scale* BESS with existing electrical infrastructure and facilities, as these properties already are owned by utilities (or governments) and the property already is in an industrial use. Also such locations already are required to have plans in place for emergency response, due to the nature of the site-specific equipment (such as transformers). The reason for doing this rather than being driven by capacity needs would be more focused on stabilizing the grid and making the system more robust. This also would have the benefit of not having to, or minimizing any, increase of footprint of industrial uses in the Rural Area, while still providing the benefits from having additional localized electric supply on standby, and to "*condition*" the grid from spread out nodes.

King County Ordinance

The recently passed **King County Ordinance 19824** concerning BESS provides current limitations on siting such facilities.

Concerns

Accessory Use—The Ordinance only covers what qualifies for an *accessory use* (i.e., for residential / commercial / industrial use) versus a *grid-connected / load-sharing / revenue-generating use*. Qualifications are needed for any off-site *grid-connected / load-sharing / revenue-generating use* arrangements.

Setback Requirements—The Ordinance states the requirement of 10 feet of spacing between BESS containers, but has no setback requirements from agricultural lands, schools, hospitals, residences, sensitive environments, and high-risk/vulnerable locations—note: BESS are an allowed use on ~97% of the King County's unincorporated land area. The State law (**WAC 51-54A-0322.4.3.1 Distance from storage to exposures**) states: "*Paragraph 3. Battery storage shall be located not less than 3 feet (914 mm) from any building, lot line, public street, public alley, public way, or means of egress, where batteries are contained in approved prefabricated portable structures providing a complete 2-hour fire-resistance rated enclosure.*"

We find that inadequate. The Ordinance allows BESS anywhere in King County except Agricultural Zoned Land. But there are no setback requirements from agricultural lands to protect it from being contaminated BESS fires. We note that these setbacks for BESS are completely inconsistent with other specific uses approved by King County:

- (1) Winery, brewery, distillery facility uses shall maintain a minimum distance of 75 feet from interior property lines adjoining rural area and residential zones.
- (2) Outdoor production area fencing as required by the Washington State Liquor and Cannabis Board for marijuana greenhouses shall maintain a minimum street setback of 50 feet and a minimum interior setback of 100 feet; and a minimum setback of one 150 feet from any existing residence.
- (3) New, modified, or expanded fossil fuel facilities shall: (1) not be located within 1,000 feet from any schools, medical care facilities, or places of assembly that have occupancies of greater than one thousand persons; (2) not be located within 250 feet from a regulated wetland or aquatic area, except when a larger buffer is required under K.C.C. chapter 21A.24, the buffer in K.C.C. chapter 21A.24 shall apply; and (3) maintain an interior setback of at least 200 feet.

Financial Liability—The Ordinance requires financial liability that is capped at \$1M: *“applicant shall demonstrate financial responsibility for public liability and environmental risks, in an amount of one million dollars, conditioned upon or responsive to the applicant’s payment of damages to persons and property, up to one million dollars, resulting from or caused by a thermal event at a battery energy storage system. Nothing in this subsection shall be construed to limit an applicant from voluntarily obtaining financial responsibility for public liability and environmental risks in excess of one million dollars.”* However, when there is a fire, clearly *commercial-scale* BESS are incredibly dangerous. The standard operating procedure is for fire departments to let a Lithium battery fire burn itself out (as there is no known effective extinguishing method). This releases a deadly chemical cocktail of gasses and smoke)ash released is extremely toxic and can be spread for miles and contaminate the surrounding land (two recent BESS fires in CA have resulted in the EPA taking over cleanup oversight and clean up is expected to take years). Clearly, a \$1M financial liability cap is inadequate. In fact, catastrophic levels of guaranteed financial liability should be required through a Bond to cover worst case scenarios. [Please see **Appendix A — Financial Liability**.]

Toxics Monitoring—The Ordinance does not require developers to install, maintain, and regularly test air-quality sensors for toxins (see **Appendix A — Financial Liability** for a list).

Emergency Response—The Ordinance does not address costs to cover purchasing of all the first responder’s *commercial-scale* BESS fire appropriate gear, equipment, vehicles, air/soil/ water testing equipment, air testing drones and robots, extra HAZMAT/scuba gear while gear is sent off for attempted cleaning/mandatory replacement gear if it can’t be cleaned, and appropriate full time staffing to ensure no drop in service-levels during a 5- to 17-day long BESS fire, HAZMAT teams and bomb squads and any other costs/expenses associated with a fire event and evacuation. Nor does it address requirements for emergency response plans.

Noise Levels—The Ordinance does not address noise levels, leaving such regulation to be permit specific based on particular zoning, which probably means a system of fines for violations. Unfortunately, *commercial-scale* BESS developers / owners often have considered such fines *“a cost of doing business.”* Clearly, there needs to be heavy fines for BESS that exceed the noise limits- not only should the BESS owner and BESS developer be fined heavily daily, but the Engineering firm that the BESS developer hired to provide the inaccurate sound study also should be subject to the fines. The *average* Li BESS generates between 96db to 106db of noise 24/7. Such *noise* levels are similar to what would be experienced when next to a subway train or factory machinery, and clearly are not compatible with rural noise levels—**KC Code 12.86.110 Environmental sound levels – maximum permissible sound levels**. calls

for a 47 to 49-dB limit in the Rural Area—note that the difference between such allowable limits and an average BESS of 100 dB—~50 dB, or 32 times !

King County Code (KCC)

The KC Council also approved a new BESS land use governed by a new *Condition 30* in **KC Code Title 21A.08.100 Regional land uses:**

Battery energy storage systems, except those defined as an accessory use under K.C.C. 21A.06.015, 21A.06.020, or 21A.06.025, are subject to the applicable permit requirements of subsection A. of this section and the following conditions:

- a. **A minimum separation of ten feet shall be maintained between rooms or enclosures containing battery energy storage systems and landscaping or other vegetation;**
- b. **As part of building permit application submittal, battery energy storage systems shall demonstrate financial responsibility for public liability and environmental risks in accordance with K.C.C. chapter 21A.XX [the new chapter created by section 16 of this ordinance] if the total system capacity is more than two megawatts and all three of the following apply:**
 - (1) **the battery technology requires thermal runaway compliance under WAC 51-54A-1207.6;**
 - (2) **any individual room, cabinet, container, or other enclosure containing the system has an energy rating greater than two megawatt-hours, or any two enclosures are less than ten feet apart; and**
 - (3) **the system does not qualify as a remote installation under IFC 1207.8.1.;**
- c. **As part of building permit application submittal, battery energy storage systems with a total system capacity more than two megawatts shall demonstrate financial responsibility for decommissioning in accordance with K.C.C. chapter 21A.XX [the new chapter created by section 16 of this ordinance];**
- d. **If financial responsibility is required by subsection B.30.b. or c. of this section, the applicant shall submit verification of financial responsibility to the department every five years, beginning five years from the date of permit issuance;**
- e. **The findings and recommendations of studies, analyses, and testing required by K.C.C. Title 17, WAC 51-54A-1207, and the International Fire Code, should be incorporated into the permit conditions for the facility; and**
- f. **As part of application submittal, the applicant shall submit verification that preliminary fire safety and evacuation plans have been shared with the local fire protection district. The final plans shall be shared with the local fire protection district before final inspection approval.**

The KC Council added a *new* SECTION 17 dealing with “*financial responsibility*” a SECTION 19 calling for the KC Executive to prepare a *BESS Study Report*.

BESS also is mentioned as an “*accessory use*” in the following three KC Code titles (language in all three is identical, except for the use of “*residential / commercial/industrial / resource,*” respectively):

21A.08.030 Residential land uses.

B.7.d. Battery energy storage systems are considered a residential accessory use when the total system capacity is two megawatts or less, and:

- (1) *the system provides electricity for on-site use only, with "on-site use" including net metering as well as charging of vehicles on-site or in the right-of-way immediately adjacent to the site; or*
- (2) *the system is intended primarily for on-site use, but also participates in load sharing or another grid-connected electricity-sharing arrangement.*

21A.08.060 Business services land uses.

18. Battery energy storage systems are considered a commercial/industrial accessory use when the total system capacity is two megawatts or less, and:

- a. *the system provides electricity for on-site use only, with "on-site use" including net metering as well as charging of vehicles on-site or in the right-of-way immediately adjacent to the site; or*
- b. *the system is intended primarily for on-site use, but also participates in load sharing or another grid-connected electricity-sharing arrangement.*

21A.08.090 Resource land uses.

B.29. Battery energy storage systems are considered a resource accessory use when the total system capacity is two megawatts or less, and:

- a. *the system provides electricity for on-site use only, with "on-site use" including net metering as well as charging of vehicles on-site or in the right-of-way immediately adjacent to the site; or*
- b. *the system is intended primarily for on-site use, but also participates in load sharing or another grid-connected electricity-sharing arrangement.*

King County Comprehensive Plan (KCCP)

The KCCP does not specifically address BESS in any Policy. In fact, only the following Policy, while not specifically mentioning BESS, addresses renewable energy (p. 3-15):

R-332 Renewable energy technologies may be sited in the Rural Area and Natural Resource Lands, as appropriate. Development standards should ensure that the siting, scale, and design of these facilities respect and support rural character.

This policy is very broad in that it encompasses all “renewable-energy technologies,” but it does call for siting to “respect and support rural character.”

While we consider all of the above a good start, we see some areas that need to be addressed in more depth, as we do under **Why is this amendment needed ?**

How Some King County Cities Have Handled BESS

Several King County cities have considered commercial-scale BESS facilities and initiated Moratoriums as follows:

Active Moratoriums—Auburn, Black Diamond, Covington, Enumclaw, and Maple Valley

Expired Moratorium—Renton

Moratoriums Under Consideration—Seattle and Snoqualmie

Also see **Appendix B — Government Actions on BESS Facilities.**

Requested Changes

King County Ordinance

The provisions in KC **Ordinance 19824** concerning *BESS* should be *revisited* to ensure safety is the priority and the following is considered as KC Code is revised:

Issues—Noise/nuisance; Maintenance of community character; and Depreciation impacts to neighboring property.

Risks—No prevention methods; No extinguishing methods; No containment methods; Insufficient staffing and equipment to handle a BESS fire; and Depletion of aquifers)

Dangers—Short- and long-term health toxic smoke, gasses, and ash forcing evacuations

Costs—Costs associated with evacuations, health issues, and environmental clean-up.

In the next section we address potential changes to KC Code that a new Ordinance can address to meet these deficiencies.

King County Code

Below we address changes we propose and our accompanying supporting rationale for two parts of KC Code **Title 21A ZONING: 21A.08 PERMITTED USES** and **21A.06 TECHNICAL TERMS AND LAND USE DEFINITIONS**.

Proposed Changes:

We propose the following **changes** in **KC Code Title 21A.08.100 Regional land uses. Condition 30:**

Battery energy storage systems, except those defined as an accessory use under K.C.C. 21A.06.015, 21A.06.020, or 21A.06.025, are subject to the Department of Ecology requirement for a Certificate of Financial Responsibility (COFR) and applicable permit requirements of subsection A. of this section and the following conditions:

- a. **A minimum separation of ~~ten~~ fifteen feet shall be maintained between rooms or enclosures containing battery energy storage systems and landscaping or other vegetation and installations shall include spill containment and drainage systems constructed of impervious surfaces that can hold all fire suppression water plus battery electrolyte volume, with no discharge to storm drains or groundwater until treated. This includes dedicated catch basins or lined containment ponds sized for full fire suppression water volume;**
- b. **As part of building permit application submittal, battery energy storage systems shall demonstrate financial responsibility for public liability and environmental risks in accordance with K.C.C. chapter 21A.49 if the total system capacity is more than ~~two megawatts~~ 500 kilowatts and all three of the following apply:**
 - (1) **the battery technology requires thermal runaway compliance under WAC 51-54A-1207.6;**
 - (2) **any individual room, cabinet, container, or other enclosure containing the system has an energy rating greater than ~~two megawatt-hours~~ 500 kilowatt-hours, or any two enclosures are less than ~~ten~~ fifteen feet apart; and**

- (3) the system does not qualify as a remote installation under IFC 1207.8.1.;
- c. As part of building permit application submittal, battery energy storage systems with a total system capacity more than ~~two megawatts~~ **500 kilowatts** shall demonstrate financial responsibility for decommissioning in accordance with K.C.C. chapter 21A.49;
 - d. If financial responsibility is required by subsection B.30.b. or c. of this section, the applicant shall submit verification of financial responsibility to the department every **five years**, beginning **five two** years from the date of permit issuance;
 - e. The findings and recommendations of studies, analyses, and testing required by K.C.C. Title 17, WAC 51-54A-1207, and the International Fire Code, should be incorporated into the permit conditions for the facility; and
 - f. As part of application submittal, the applicant shall submit verification that preliminary fire safety and evacuation plans have been shared with the **local police authority and local fire protection district and evacuation plans must be approved by the local police authority and local fire protection district**. The final plans shall be shared with the **local police authority and local fire protection district and be approved by the local police authority and local fire protection district** before final inspection approval.

Supporting Rationale for the Proposed Changes Above:

The addition of the **Department of Ecology requirement for a Certificate of Financial Responsibility (COFR)** is needed because of the potential dangers and the Federal Environmental Protection Agency (EPA) being required to take over cleanup and take an active role in supervising BESS fire cleanup due to the widespread toxic nature of a lithium BESS fire. All Lithium BESS facilities should be required to prove they can cover toxic run-off cleanup costs, toxic fallout/ash cleanup costs, and cover all other environmental and wildlife-related injury costs demonstrated through insurance, surety bonds, guarantees, or self-insurance, submitted via the Secure Access Washington (SAW) portal, ensuring sufficient funds for damages and protecting the environment.

The change from **ten to fifteen feet between rooms and enclosures** is needed because previously, there was a 5-ft required separation distance between BESS containers, but after the Victorian Big Battery BESS fire in Australia in 2021, the industry adjusted to a 10-ft separation requirement, which unfortunately has proven to not be sufficient with two more BESS fires jumping the 10-ft gap to ignite another BESS container (see: Boulder City, Nevada - September 2025 and California Flats Solar Project Fire in Monterey, CA - August 2025). Additionally, in many BESS fires *nearby* BESS containers have been scorched, even though millions of gallons of water were sprayed on adjacent BESS containers to try to keep them cool.

The inclusion of **spill containment and drainage systems** is necessary, in fact, KC Code **Title 9 Surface Water Management** requires such containment of hazardous runoff: (1) **Title 9.04 Stormwater Runoff and Surface Water & Erosion Control** requires that all development manage stormwater to prevent pollution of surface waters; (2) **Title 9.12 Water Quality** explicitly prohibits discharge of pollutants—including hazardous firewater runoff—into county stormwater systems; and (3) **Title 9.14 Groundwater Protection** mandates measures to prevent contamination of groundwater from materials defined as hazardous materials. The **National Fire Protection Association (NFPA)**—a global non-profit that develops and maintains standards for fire prevention, electrical safety, and related hazards to eliminate death, injury, and property loss—publishes widely adopted codes. **NFPA 855** requires BESS installations to include spill containment and drainage systems that can hold all fire suppression water plus battery electrolyte volume. The **International Fire Code (IFC)**—adopted by Washington State

—mandates impervious surfaces under BESS units and secondary containment for hazardous liquids. **Federal EPA** guidance states that firewater from Li-ion battery fires is considered hazardous wastewater; facilities must design pads and catch basins to prevent uncontrolled release. Finally, a Stormwater Pollution Prevention Plan (SWPPP) is required under the National Pollutant Discharge Elimination System (NPDES)—a core part of the Federal Clean Water Act that regulates point source discharges of pollutants stormwater program for BESS constructed larger than or equal to 1 acre. The EPA defines a SWPPP as a site-specific plan identifying pollutant sources and stormwater controls.

The changes from **two megawatts to 500 kilowatts** on system capacity are needed because two megawatts is enough to power 2,000 homes for 4 hours and no normal residence would have that kind of backup battery power as an *accessory*. A typical home in the United States uses an average of ~30 kilowatt-hours (kWh) of electricity per day. This translates to under 1,000 kWh per month. In fact, this part of KC Code should distinguish between *residential* accessory use and *business* accessory use, possibly with ~100kW for residential use and ~500kW for business accessory use. No accessory use needs two megawatts.

The change from **two megawatt-hours to 500 kilowatt-hours** for system energy rating is needed because two megawatt-hours is four times more likely to have a *thermal-runaway* event with the consequences/impact being four times worse (*thermal runaway* is a chain reaction where heat from one cell triggers adjacent cells to overheat resulting in stored chemical energy converting to thermal energy). We can see some businesses potentially needing up to 500 kWh if they have solar, so, possibly, a requirement that businesses that want to have more than 100 kwh of battery storage have equivalent sized solar system to charge up the batteries.

The changes from **every five years to every year** to submit verification of financial responsibility and beginning **two years** instead of **five years** from the date of permit issuance are needed because BESS developers and owners create LLC's to legally separate them from BESS *thermal-runaway* events, e.g., have their LLCs shut down / file bankruptcy to avoid paying clean-up costs. Currently in Moss Landing, CA, January 2025 (see **Appendix D — References**), the BESS owner is *not* taking responsibility for damages beyond its facility's fence-line, and it isn't being held accountable for the environmental damages, injuries caused from exposure, and damages to crops, wildlife, and the environment. Other BESS developers / owners (LLCs) have disappeared and /or filed bankruptcy. If BESS have a fire anywhere near people, homes, schools, gathering places, and environmentally vulnerable locations, King County needs to verify that funds are readily available to meet clean-up, etc. needs.

The changes regarding **evacuation plans** are needed because all too often the standard evacuation plans submitted by BESS developers are drawn up to *minimize* the concerns enumerated herein.

Proposed Changes:

Where BESS is mentioned as an “*accessory use*” as in KC Code **Titles 21A.08.030 Residential land uses, B.7.d.; 21A.08.060 Business services land uses, B. 18;** and **21A.08.090 Resource land uses, B. 29.**, which all have identical language (*note: descriptions shown in [] below pertain to each particular title, respectively*), we propose the following changes in that language:

Battery energy storage systems are considered a [residential / commercial/industrial / resource] accessory use when the total system capacity is two megawatts 500 kilowatts or less, and_:

- (1) *the system provides electricity for on-site use only, with "on-site use" including net metering as well as charging of vehicles on-site or in the right-of-way immediately adjacent to the site; or*
- (2) *the system **is non-lithium battery based and** is intended primarily for on-site use, but also participates in load sharing or another grid-connected electricity-sharing arrangement.*

Supporting Rationale for the Proposed Changes Above:

The changes from **two megawatts** to **500 kilowatts** on system capacity are needed because, as described earlier, two megawatts is enough to power 2,000 homes for 4 hours and no normal residence would have that kind of backup battery power as an *accessory*. A typical home in the United States uses an average of ~30 kilowatt-hours (kWh) of electricity per day. This translates to roughly 1.000 kWh per month. Again, this part of KC Code should distinguish between *residential* accessory use and *business* accessory use, possibly with ~100kW for residential use and ~500kW for business accessory use. No accessory use needs two megawatts.

The qualification for a **non-lithium battery based** is to ensure that safer Alternative Energy Storage Systems (see **Appendix C — Alternate Energy Storage Solutions**) can be used as an accessory use and participate in both net metering and/or load sharing/grid-connected electricity sharing arrangements. For the long term looking at safer alternatives like Long Duration Energy Storage (LDES) options can meet our energy storage needs as they can provide power for days/weeks vs. lithium's max 4 hours, while possessing life expectancies of several decades vs. lithium's 8-10 years.

Why is this amendment needed ?

The **2024 KCCP Major Update Final Environmental Impact Statement (FEIS)** states the following:

p. 2-13: "Adopt standards to limit or prohibit the location and development of battery energy storage systems in the unincorporated area, especially near residences and places people congregate."

We seek that KC Code and any associated Policy align with the above statement. In addition our request herein is needed to ensure full compliance with the State's *Growth Management Act (GMA)*, PSRC's *VISION 2050*, King County's *Countywide Planning Policies (CPPs)*, and other portions of the *KCCP*, as described below.

State GMA (adopted October 1990)

Maintaining Rural Area character is discussed in:

- RCW 36.70A.11** Defines rural lands.
- RCW 36.70A.020** Includes planning goals for rural lands.
- RCW 36.70A.070** Defines the Rural Element for Comprehensive Plans.

PSRC VISION 2050 (adopted October 2020)

Maintaining Rural Area character is discussed in:

DEVELOPMENT PATTERNS

Rural Areas and Natural Resource Lands

MPP-DP-32: *"Contribute to improved ecological functions and more appropriate use of rural lands by minimizing impacts through innovative and environmentally sensitive land use management and development practices."*

MPP-DP-37: *"Ensure that development occurring in rural areas is rural in character and is focused into communities and activity areas."*

MPP-DP-41: *"Establish best management practices that protect the long-term integrity of the natural environment, adjacent land uses, and the long-term productivity of resource lands."*

KC CPPs (as amended in 2023)

Maintaining Rural Area character is discussed in:

ENVIRONMENT

Environmental Sustainability

EN-1 “Incorporate environmental protection and restoration efforts including climate action, mitigation, and resilience into local comprehensive plans to ensure that the quality of the natural environment and its contributions to human health and vitality are sustained now and for future generations.”

DEVELOPMENT PATTERNS

Rural Area and Natural Resource Lands

Rural Area

The Rural Area is characterized by low density development with a focus on activities that are dependent on the land such as small-scale farming and forestry.

DP-47 Limit growth in the Rural Area to prevent sprawl and the overburdening of rural services, minimize the need for new rural infrastructure, maintain rural character, and protect open spaces and the natural environment. To limit growth pressure in the Rural Area, locate services in Cities in the Rural Area and cities that border the rural area.

KCCP (adopted December 2024)

Maintaining *Rural Area character* is discussed on p. 3-1 in *Chapter 3. RURAL AREAS AND NATURAL RESOURCE LANDS, Part I. Rural Area* (note: our **emphases** below):

“Preserving rural King County plays a key role in ensuring a continuing variety of landscapes, maintaining the diverse communities that often portray the rural legacy, and supporting the evolving rural economic opportunities for the county and its residents. The rural landscape is characterized by extensive forests and farm lands, free-flowing rivers and streams that provide high-quality habitat for fish and wildlife, and a mixture of housing types along with small commercial enterprises and business hubs.... Conserving the Rural Area and Natural Resource Lands in King County is integral to providing diversity in lifestyle choices; sustaining farming and forestry economies; protecting environmental quality and wildlife habitat; providing recreation opportunities; and maintaining a link to the county’s resource-based heritage.”

The *Wildland-Urban Interface and Fire Resilience* are discussed on pp. 3-29 to 3-30 in *Chapter 3. RURAL AREAS AND NATURAL RESOURCE LANDS, Part VIII. Natural Resource Lands* (note: our **emphases** below):

Reducing Risk in the Wildland-Urban Interface

Wildland-urban interface areas include Vashon-Maury Island and areas of east King County, such as in the Four Creeks/Tiger Mountain, Snoqualmie Valley/Northeast King County, and Greater Maple Valley/Cedar River Community Service Areas.

Proactive steps that can benefit wildfire risk reduction in the wildland-urban interface include outreach and technical assistance to forest landowners and residents on best management practices for reducing wildfire risk; developing wildfire preparedness, response, and recovery plans; controlling for invasive species that can act as an accelerant for fire; evacuation planning; and building strong partnerships that support effective planning and response. Vegetation management around homes and critical infrastructure is also an important tool for reducing risk and should be pursued in ways that avoid impacts to critical areas.

R-736 King County shall take steps to plan for and reduce wildfire risk in the wildland-urban interface in unincorporated King County including wildfire risk assessment and planning, amending codes to align with best practices for wildfire risk reduction, and public education.

R-737 King County shall encourage wildfire preparedness, including wildfire risk assessment and planning, in cities and towns located in the wildland-urban interface in King County.

R-738 King County shall make residents aware of the dangers of forest fires and encourage them to take steps to make their properties less vulnerable.

Such preparedness planning is critical and is directly impacted by siting of *commercial-scale* Li-BESS in the Rural Area of King County where critical infrastructure is sorely lacking, including roads and escape routes, water availability, enhanced fire-fighting equipment, and fast emergency medical assistance.

All of the above make it very clear that, while *residential-scale* Li-BESS can be adequately sited in the Rural Area, *commercial-scale* Li-BESS has no place in the Rural Area of King County, except where electrical infrastructure and facilities owned by utilities (or governments) exist and such property already is a legal industrial use.

What are the expected or desired outcomes of this change ?

Changes requested herein will restore GMA-required integrity of the Rural Area, ensure safety of residents and infrastructure, and support the intent that rural growth rates will be reduced over time.

What are the potential positive or negative impacts of this change ?

Positive: See above under **What are the expected or desired outcomes of this change ?** and the Supporting Rationale for each proposed change provided under **Requested Changes**.

Negative: None.

How is this amendment consistent with the Growth Management Act ?

The WA State Growth Management Act (GMA) calls for the following:

RCW 36.70A.11 Findings—Rural lands. (our highlighting):

...a county should foster land use patterns and develop a local vision of rural character that will: Help preserve rural-based economies and traditional rural lifestyles; encourage the economic prosperity of rural residents; foster opportunities for small-scale, rural-based employment and self-employment; permit the operation of rural-based agricultural, commercial, recreational, and tourist businesses that are consistent with existing and planned land use patterns;....

RCW 36.70A.070 Comprehensive plans—Mandatory elements. (our highlighting):

(5) Rural element. Counties shall include a rural element including lands that are not designated for urban growth, agriculture, forest, or mineral resources....

In each of these **RCWs** rural character and integrity are emphasized.

The GMA also provides clear *definitions* regarding the integrity of the Rural Area (our highlighting):

RCW 36.70A.030 Definitions

(35) "Rural character" refers to the patterns of land use and development established by a county in the rural element of its comprehensive plan:....

Conclusions and Recommendations

Conclusions

Battery storage options are needed as we continue the transition to an all renewable energy system for powering our planet. Herein we have offered proposed changes to existing KC Code to ensure better safe outcomes should Li BESS be deployed. We believe our proposed changes, once enacted, would assure much better safety when deploying Li BESS.

There are three potential concerns with Li BESS: (1) *Thermal runaway* which would force evacuation of nearby residents, etc.; (2) *Noise levels* between 96dB to 106dB 24/7; and (3) *Environmental contamination*.

Commercial-scale Li BESS have no place in King County's Rural Area where critical infrastructure and emergency response are critically lacking, except co-location with existing electrical infrastructure and facilities, as these properties already are owned by utilities (or governments) and the property already is in an industrial use. Siting of Li BESS near Schools, hospitals, care facilities, and neighborhoods would require miles of setbacks and, thus, would prove impractical.

Commercial-scale Li BESS facilities sited in King County should be required to prove they have trained Hazardous Material Response crews, trained in dealing with metal fires, as well as more general Hazardous Material training and possess the equipment, supplies, and infrastructure to support the necessary types of emergency response.

Many *alternative* energy storage solutions exist that do not have the risks, nor issues, associated with Li-BESS (see **Appendix C—Alternative Energy Storage Solutions**).

Recommendations

Revisit KC Council **Ordinance 19824** by preparing a new ordinance to address our concerns.

Consider the proposed KC Code changes herein, especially siting limitations based on available infrastructure. In fact, *commercial-scale* Li BESS only should be allowed in infrastructure-rich heavy industrial zoned areas.

Site *commercial-scale* BESS in the Urban Growth Area, where needed infrastructure exists, especially for equity reasons, given that <5% of King County's population lives in the Rural Area (far less on Agricultural and Forest lands) and they primarily would serve urban areas and large companies.

Require builders/owners of all *commercial-scale* BESS to be fully liable for any damages caused.

Disallow use of Wetland Mitigation Credits for potential *commercial-scale* BESS sites possessing critical wetlands.

Disallow siting any *commercial-scale* BESS facilities on Public Lands including those purchased with any type of Conservation funding (Local or State).

Require Public Notice, Public Meetings, and full KC Council approval of any proposed *commercial-scale* BESS facility and site.

Appendix A — Financial Liability

Clearly, a \$1M financial liability cap is inadequate for *commercial-scale* BESS. In fact, catastrophic levels of guaranteed financial liability should be required through a Bond to cover worst case scenarios.

Ordinance 19824 concerning BESS requires financial responsibility for decommissioning as well—which should cover all foreseeable costs of a non-thermal runaway decommissioning which returns the site back to its initial state—including removing all underground systems, gravel, concrete slabs, and all associated systems. To complete this, soil samples should be taken throughout the site as part of the pre-construction requirements and sent to an independent lab (chosen by the local government) for testing/reporting and after decommissioning, soil tests should be sent to the same lab to ensure the land has been fully restored to pre-BESS condition. Additionally, due to many BESS sites having trees, shrubs, and other plants that were removed for the BESS, they all must be restored to a similar habitat with guaranteed survival of the rebuilt ecosystem for a decade.

Furthermore, the BESS financial responsibility Bond must cover the full cleanup costs when there is a fire- including the whole BESS facility and surrounding areas (potentially 5+ miles away) based on recent BESS fires data- and, to enable proper cleanup, lab testing should be required to have historical and comparable soil, water, and environmental test results on hand/recorded for pre-BESS conditions which will be used in the event of a fire to have a documented comparable soil/water/environmental lab test data, the same lab tests should be completed for a reasonable amount of locations expanding out to a 5-mile radius around the BESS site and kept on file for future comparison to post-BESS fire samples. The air/soil/environmental tests should test for all known substances released from a BESS fire:

Hydrogen cyanide (HCN), Hydrogen chloride (HCl), Chlorine (Cl₂), Hydrogen sulfide (H₂S), Nitrogen dioxide (NO₂), Sulphur dioxide (SO₂), Phosphoryl fluoride (POF₃), Ammonia (NH₃), Hydrogen fluoride (HF), Fluorinated Compounds (e.g., PF₅, CF₄), Phosphorus pentafluoride (PF₅), Tetrafluoromethane (CF₄), Dioxins/Furans, Persistent organic pollutants, Carbon Monoxide (CO), Carbon dioxide (CO₂), Hydrocarbons, Hydrogen (H₂), Solvents, Formaldehyde, Benzene, Acetylene, Lithium (Li), Cobalt (Co), Nickel (Ni), Manganese (Mn), Particulate Matter (PM_{2.5}/PM₁₀) Fine particles penetrate deep into lungs, causing inflammation, asthma exacerbation, and cardiovascular strain. Heavy metals (Li, Co, Ni, Mn) in PM increase toxicity.

The BESS Ordinance states: *“Consistent with chapter 36.32 RCW, King County shall not require any state agency or unit of local government to secure the performance of a permit requirement with a financial guarantee as a condition of issuing a permit or approval for a building construction project. The director, however, may request a state agency or unit of local government to sign an agreement to complete required improvements, or to complete retention of required financial responsibility consistent with K.C.C. ((21A.08.100)) chapter 21A.XX (the new chapter created by section 16 of this ordinance), and protect the county's rights and duty to remedy unsatisfactory performance.”* Local governments that are within a 5-mi radius should be listed on the Bond and escrow liability funds as it will be their citizens, emergency responders, schools, businesses, and evacuation sites that will bear the brunt of handling potentially 1,000's of families with a BESS fire and associated evacuations and shelter in place orders, and during the fallout clean up.

Many Rural Area businesses are family-owned and cannot afford legal fees to challenge BESS owners after a serious accident. Any incident could lead to costly compensation disputes. A bond would guarantee funds for compensation without financially burdening such communities.

Appendix B — Government Actions on BESS Facilities

State Actions on BESS in Washington State (As of December 6, 2025)

Entity	Type	Status	Details	Dates/ Citations
Washington State Building Code Council (SBCC) / WA Fire Code	Code Adoption	Active/In Progress	Incorporating NFPA 855 into WA Fire Code for baseline safety standards; statewide fire marshal guidance and rulemaking ongoing. maplevalleywa.gov +1	2023– Ongoing
Energy Facility Site Evaluation Council (EFSEC)	State Permitting/ Siting Review	Active	Reviews large/utility-scale BESS as part of site certification; stand-alone BESS may opt-in; subsumes local approvals for qualifying projects; approved Carriger Solar with BESS in June 2025. whatcomcounty.us +3	Ongoing
Washington State Department of Ecology	Guidance Development	In Progress	Compiling guidance on BESS facility siting, referenced in multiple local moratoriums for study purposes. blackdiamondwa.gov	Initiated 2025
Governor's Office	Project Delay	Active	Delayed final approval of hybrid BESS proposal (e.g., Cypress Creek Renewables project) in September 2025 due to safety and environmental concerns; no statewide moratorium but indicates scrutiny. energy-storage.news	September 2025– Ongoing

Cities in Washington State with BESS Actions (As of December 6, 2025)

City	Type	Status	Details	Dates/Citations
Anacortes	Discussion	Discussed/No Formal Action	Planning Commission discussed community concerns over BESS impacts; no ordinance proposed.	April 23, 2025
Auburn	Moratorium	Active (Extended)	6-month moratorium adopted; extended for another 6 months due to safety concerns; council study session briefing on national incidents.	Adopted May 2025 (Ord 6785); Extended November 3, 2025 (until ~May 2026)
Black Diamond	Moratorium	Active (Extended)	Moratorium renewed multiple times to study risks and safety; public hearings held. blackdiamondwa.gov +1	Renewed February 2025 (Ord 25-1219); Extended September 2025 (until ~March 2026)

Chehalis (Lewis County)	Moratorium	Unconfirmed/ Likely Expired	Reported 12-month moratorium for safety/zoning standards; no official confirmation found in searches or official site.	Reported early 2024 (Ord 1038-B; expired ~early 2025)
Covington	Moratorium	Active (Extended)	Temporary moratorium extended multiple times for study and regulations. covingtonwa.gov	Extended April 2025 (Ord 03-2025), October 2025, November 2025 (until ~May 2026)
Ellensburg	Moratorium	Unconfirmed/ Future	Reported new 12-month emergency moratorium; no evidence found as of December 6, 2025—official site shows no related ordinances or discussions.	Reported February 18, 2026 (Ord 01-26; post-current date)
Enumclaw	Moratorium	Active	12-month moratorium adopted to review developer proposals and extensions; public hearing held.	Adopted April 2025 (Ord 2980/2809; until ~April 2026)
Kennewick (Benton County)	Moratorium	Unconfirmed/ Likely Expired	Reported moratorium on utility-scale BESS (>600 kWh) for safety/zoning; no confirmation or Ord 9958 found on official site.	Reported December 2023 (expired ~mid-2024)
La Conner	Proposed Moratorium	Denied/Tabled	Emergency moratorium proposed but tabled amid discussions; ongoing concerns. laconnercommunitynews.org	Proposed/Tabled June 2025
Maple Valley	Moratorium	Active	6-month moratorium adopted; public hearing on impacts. maplevalleywa.gov +3	Adopted July 14, 2025 (Ord O-25-854/O-12-1125; until ~January 2026); Hearing September 8, 2025
Moses Lake (Grant County)	Moratorium	Unconfirmed/ Likely Expired	Reported 12-month moratorium on utility-scale BESS; no confirmation or Ord 2952 found on official site.	Reported February 2024 (expired ~February 2025)
Mount Vernon	Moratorium	Active (Extended)	Emergency moratorium extended to study impacts and code changes. mountvernonwa.gov +2	Adopted May 29, 2025 (Ord 2025-009/3915); Extended July 2025 (until ~July 2026)
Pasco (Franklin County)	Restrictive Ordinance	Permanent Law/ Unconfirmed	Reported strict code with setbacks (e.g., 500 ft from residences, containment systems); functions as de facto restriction; no PMC 23.90 or details found on official site.	Reported Post-2023

Port Angeles	Discussion	Unconfirmed/ Future	Reported council briefing on BESS safety/regulations; no evidence found on official site.	Reported February 18, 2026 (post-current date)
Renton	Moratorium	Expired	Previous moratorium not renewed.	Expired October 2022
Seattle	Permit/ Code Requirements	Active	ESS questionnaire and permit intake required; SFD & SDCI guidance for all ESS installations.	Effective January 2024–Ongoing
Sedro-Woolley	Moratorium	Active	Indefinite moratorium until comprehensive plan completion; unanimous vote due to opposition to proposed BESS. fox13seattle.com	Enacted early 2025 (Ord 2025-01)
Snoqualmie	Discussion	Discussed/No Action	Community forums on 25-acre BESS proposal; no moratorium.	June 2024
Spokane Valley (Spokane County)	Restrictive Ordinance	Permanent Law/ Unconfirmed	Floodplain regs prohibit certain uses in 100-year floodplain; no explicit BESS prohibition or SMC 21.03.020 details confirmed on official site.	Reported Ongoing
Walla Walla (City)	Zoning Exclusion	Permanent Law/ Unconfirmed	Reported exclusion from Urban Growth Area; no council action 2024 found on official site.	Reported 2024

Counties in Washington State with BESS Actions (As of December 6, 2025)

County	Type	Status	Details	Dates/Citations
Benton	Moratorium	Expired	No recent extensions; lapsed, with EFSEC handling some projects.	Expired ~2025
Clark	Zoning Ban	Permanent Law/ Unconfirmed	Reported prohibition on utility-scale BESS in rural/residential zones (industrial only); no CCRC 40.260.070 or details found on official site.	Reported Late 2023
Franklin	Moratorium	Unconfirmed/ Likely Expired	Reported 12-month moratorium on utility-scale BESS; no Res 2024-67 found on official site.	Reported April 2024 (expired ~April 2025)
King (Unincorporated)	Restrictive Code	Permanent Law	Comprehensive regulations for BESS; consumer-scale allowed as accessory use; special use permit for larger systems. nwrealtor.com	Adopted October 2024 (Ord 2023-0263/KCC 21A.08.220)

Kitsap	Moratorium	Active	365-day moratorium with workplan for new regulations. kitsap.gov +5	Adopted June 11, 2025 (Ord 39-2025/639-2025/617-2025; until June 10, 2026)
Kittitas	Restrictive Ordinance/CUP Process	Permanent Law	Strict conditional use permit (CUP) process for utility-scale BESS; recent SEPA/CUP filings (e.g., Wind Ridge BESS). canada.constructconnect.com +2	Adopted 2024–Ongoing (KCC 17.90)
Klickitat	Moratorium/ Proposed Restrictions	Active (Extended)	6-month moratorium extended; proposes severe restrictions on industrial solar + BESS; PAC assisted development; prohibited in all zones pending ordinance. klickitatcounty.gov +1	Extended September 2, 2025 (Res 05225; until March 2, 2026); Proposed Hearing September 15, 2025
Lewis	Discussion	Unconfirmed/ Future	Reported commissioners discussed moratorium; no evidence or vote found on official site.	Reported February 24, 2026 (post-current date)
Skagit	Limited Moratorium	Expired	Interim moratorium on farmland energy projects (including BESS); lapsed with ongoing appeals; may prohibit large energy projects on vulnerable agricultural land (new finding from Sep 2024, but not a full moratorium renewal). cascadiadaily.com	Adopted September 23, 2024 (Ord 2024-030; expired ~March 2025); Hearing October 21, 2024
Thurston	Proposed Action	Denied	Specific BESS proposal rejected; workgroup developing model ordinances, significant opposition including public comments on thermal runaway risks. thurstoncountywa.gov +1	November 2025
Walla Walla	Moratorium	Unconfirmed/ Likely Expired	Reported 6-month moratorium on large-scale BESS; no Res 2024-045 found on official site.	Reported June 2024 (expired ~December 2024)
Whatcom	Moratorium	Unconfirmed/ Future	Reported 6-month emergency moratorium; no specific evidence or Ord 2025-069 found on official site as of December 6, 2025.	Reported December 10, 2025 (post-current date)
Yakima	Moratorium	Active (Likely Extended)	6-month moratorium on large BESS; extended for related solar rules; note: conflicting Res numbers (15-2025/64-2025) in reports, but unconfirmed—likely a typo, no details found. facebook.com +2	Adopted March 18, 2025; Extended July 2025

Tribes/Other Entities in Washington State with BESS Actions (As of December 6, 2025)

Entity	Type	Status	Details	Dates/ Citations
Swinomish Indian Tribal Community	Opposition	Active	Opposed Goldeneye BESS project in Skagit County due to threats to Hansen Creek restoration and salmon habitat; collaborated with other tribes and agencies. efsec.wa.gov	August 2024– Ongoing
Upper Skagit Indian Tribe	Opposition	Active	Joined opposition to BESS facilities in Skagit Valley (e.g., Goldeneye), citing environmental impacts on tribal lands and resources. facebook.com	September 2024– Ongoing
Skagitonians to Preserve Farmland (Community Group)	Opposition	Active	Objected to BESS proposals on farmland, emphasizing safety risks and environmental threats; urged state council rejection.	July 2025– Ongoing
Sedro-Woolley Residents (Petition via Change.org)	Opposition	Active	Petition against largest BESS in WA near Hansen Creek, citing fire, pollution, and salmon risks; thousands signed. facebook.com	August 2024– Ongoing
Rochester Residents (Thurston County)	Opposition	Active	Community concerns over "catastrophic" risks from proposed lithium-ion BESS; decision pending as of October 2025. chronline.com	October 2025– Ongoing
Mount Vernon Councilmember Joe Burns	Opposition	Active	Steadfast opposition to proposed BESS east of city; formal letter to EFSEC. electjoeburns.com	October 2025– Ongoing
Sedro-Woolley Mayor Julia Johnson	Opposition	Active	Urged governor to reject Goldeneye BESS due to fire and environmental risks. fox13seattle.com	August 2025– Ongoing

Appendix C — Alternate Energy Storage Solutions

There exist several Alternate Energy Storage Solutions, some of which are listed below.

Flow Battery (Redox Flow and Hybrid Flow)

These systems use two liquid electrolyte solutions to store energy, offering high cycle life and scalability, generally using non-flammable materials.

- ESS Inc.: Specializes in iron flow battery technology for utility-scale applications, with commercial products like the Energy Center and an operational project validated by third parties.
- Eos Energy Enterprises: Offers zinc-powered, aqueous zinc hybrid cathode battery systems, with the Z3 battery modules designed for 3-12 hour durations and proven in use with significant discharged energy in the field.
- Invinity Energy Systems: Provides vanadium flow battery solutions that are non-degrading and have a high throughput.
- Sumitomo Electric Industries: Involved in vanadium flow battery technology with operating projects.
- Cellcube: A technology provider in the energy storage industry, focused on vanadium flow batteries.
- Rongke Power (Dalian Rongke Power): Specializes in vanadium flow battery technology.
- Stryten Energy: Offers lead-acid and lithium-ion solutions, but also has non-lithium LDES options available.
- Voltstorage: Develops safe and sustainable flow battery storage systems.
- Redflow: An Australian company specializing in zinc-bromine flow batteries for stationary storage.
- Primus Power: Offers zinc-flow battery systems designed for grid-scale applications.

Thermal Energy Storage

These systems store energy as heat in various mediums (e.g., solid carbon, crushed rocks, molten salts) and release it as heat or electricity for industrial processes or power generation.

- Antora: Creates thermal batteries using solid carbon blocks to provide industrial heat and power with zero emissions.
- Brenmiller Thermal Energy Storage: Offers scalable thermal energy storage solutions using crushed rocks (bGen™ ZERO thermal battery).
- Rondo Energy: Creates thermal batteries using super-heated bricks (Rondo Heat Battery) to store renewable energy for industrial heat applications.
- 1414 Degrees: Develops silicon-based thermal energy storage technology (SiBox™).
- Malta: Develops a pumped heat energy storage system using molten salts.
- Kraft Block: Develops high-temperature thermal energy storage systems using industrial-grade materials

- Magaldi Power S.p.A.: Magaldi's system is a thermal energy storage system using sand (Magaldi Green Sand Battery)

Mechanical Energy Storage

These solutions store energy through physical movement or pressure.

- Energy Vault: Specializes in gravity-based energy storage solutions, which use robotics to lift and lower large composite blocks.
- Hydrostor: Specializes in Advanced Compressed Air Energy Storage (A-CAES), a technology for large-scale projects, with a 500 MW project in development.
- Energy Dome: Uses a CO₂-based energy storage system (liquid CO₂ battery) with a commercial plant already in operation.
- Rye Development: Focuses on developing traditional pumped-hydro storage projects
- Gravitricity: uses decommissioned mineshafts and gravity-based technology
- PowerSouth Energy Cooperative: has been operating a CAES since 1991 which provides 110MW of power for up to 26 hours (2,860MWH).

Other Long Duration Energy Storage Technologies

- Enervenue: Develops metal-hydrogen battery technology for long-duration storage.
- Form Energy: Develops iron-air batteries for multi-day storage.
- Altris/Northvolt: Developing sodium-ion battery technology, seen as a commercially mature alternative to lithium-ion for energy storage systems.

In the Future

Soon to be available energy storage solutions- These companies' technology is either still in earlier stages of commercialization, not broadly available yet, or they serve very niche markets that do not yet have a widespread "*available now*" product line:

- Ice Energy: Focuses on localized thermal energy storage for air conditioning units rather than large-scale grid LDES.
- Mainspring Energy, TechnipFMC, Ceres, Magaldi, Sumitomo SHI FW (SFW), Build To Zero, Energy Intel, i Battery, TerraFlow Energy, Sens, Arecor, Echogen, Hyme, Noon Energy, Quidnet, and XL Batteries:

Appendix D — References

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