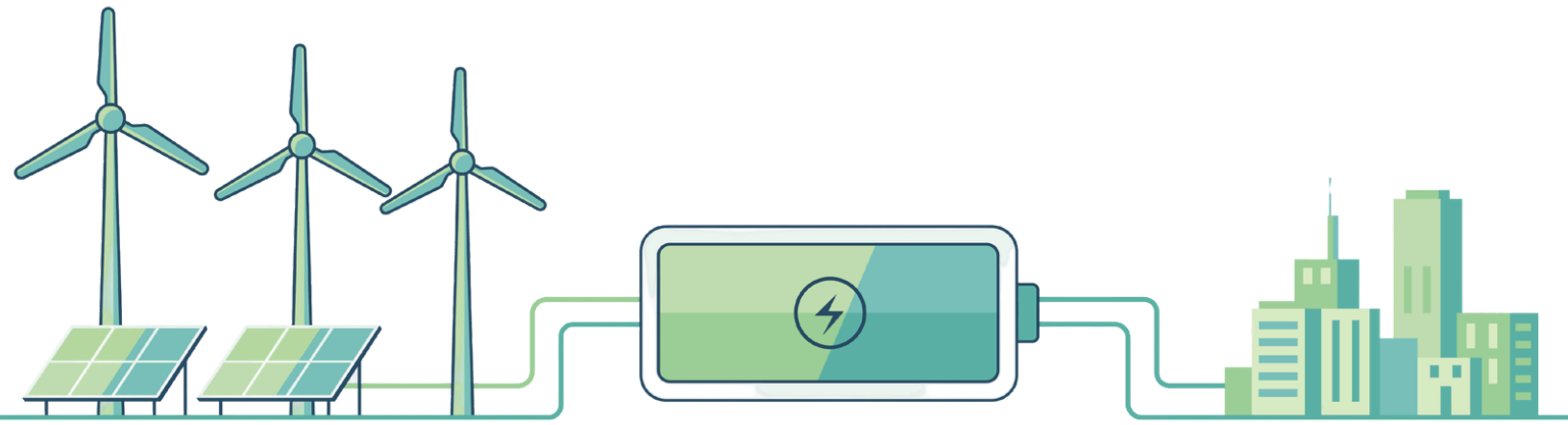
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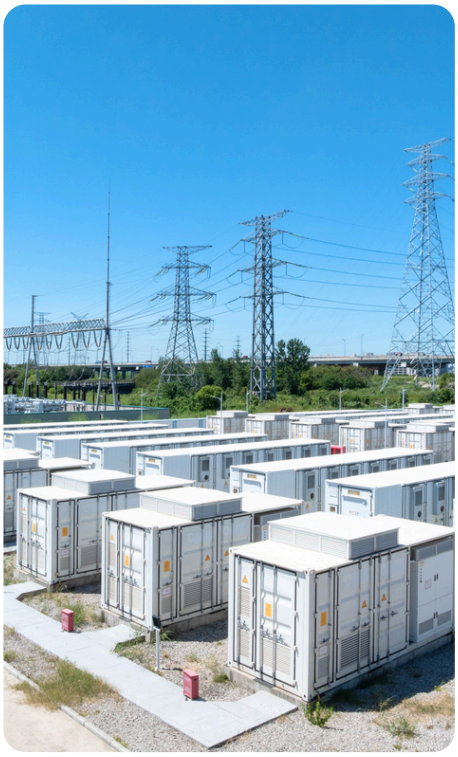
BESS Siting and Design Considerations

Getting to the right location, design and community fit

What is BESS?

Battery energy storage systems, often referred to as BESS, store electricity for later use. When electricity generation exceeds demand, electricity from all energy sources, including wind, solar, hydropower, geothermal, and natural gas, can be stored in batteries and discharged when additional power is needed.





How Siting and Design Help Manage Local Impacts

Good siting and design help a BESS project fit both the electric grid and the surrounding community.
Location determines:

- Whether a project can provide useful grid benefits, while design details such as setbacks, screening, lighting, noise management, emergency access, stormwater controls, and decommissioning planning help address site-specific impacts.
- Local governments do not need a one-size-fits-all standard, but they should expect a clear explanation of why the site was selected and how the project design responds to local conditions.

Why Location Matters

Location is one of the most important factors in determining whether a BESS project works well for both the grid and the surrounding community.

BESS facilities are often proposed near substations, transmission lines or distribution infrastructure because those are the places where storage can provide important local and grid benefits.

Locating projects near existing infrastructure can help utilities make better use of the grid already in place, and may help avoid or defer certain costly upgrades, depending on the project's purpose and how it is integrated into utility planning.

Good siting does more than support the grid. It also helps address local questions about neighboring homes, roads, farms, waterways, emergency access, construction activity, and long-term compatibility with the surrounding area.

Designing Projects to Fit Local Surroundings

BESS projects can be designed to reflect site-specific conditions and to address project impacts through applicable standards and local permitting requirements. Rather than relying on a one-size-fits-all approach, project design should be tailored to the site, surrounding land uses, and the impacts that may reasonably need to be addressed.

Depending on the project, design considerations may include:

- Separation Distances
- Contruction Traffic Planning
- Visual Mitigation
- Stormwater Controls
- Lighting Controls
- Vegetation Maintenance
- Fencing and Security
- Emergency Access
- Noise Management
- Decommissioning Planning

BESS facilities typically have a smaller physical footprint than many other types of energy infrastructure. After construction, they generally generate little traffic and do not create ongoing public activity, emissions or odors.

Still, design details matter. Local governments can use zoning standards, permit conditions, site plan review, and development agreements to help address site-specific concerns and create clear expectations for construction, operation, maintenance, safety and decommissioning.

Common Planning Tools

Communities can use a range of planning tools to address site-specific impacts without creating a universal standard for every project. The purpose of these tools is to connect local requirements to the specific impacts they are intended to address.

- **Setbacks or separation distances** to provide space between BESS equipment, property lines, roads, buildings, waterways, or other nearby uses.
- **Screening, landscaping, and lighting controls** to help manage visual impacts and reduce light spillover onto neighboring properties.
- **Noise standards and equipment placement** to address sound from inverters, HVAC systems, and other operating equipment.
- **Emergency access requirements** to ensure responders can safely reach the site, move around the facility, and access key equipment if needed.
- **Stormwater, vegetation, and site maintenance** requirements to address drainage, fire prevention, weeds, and long-term site conditions.
- **Construction traffic and operations plans** to manage temporary impacts during construction and clarify expectations during operation.
- **Decommissioning requirements** to identify how equipment will be removed and how the site will be managed at the end of the project's useful life.

These tools work best when they are tied to the project's location, design, surrounding land uses, and local priorities. They should help communities ask practical questions and set clear expectations without assuming every BESS project requires the same conditions.

Safety and Emergency Response Planning

Safety review should be considered part of site design. A well-designed BESS project should account for emergency access, equipment spacing, fire protection, signage, shutoff information, monitoring responsibilities, and coordination with first responders.

Modern BESS projects are reviewed under national standards and testing protocols that help guide safe installation and operation.

NFPA 855	The core national standard for the installation of BESS. It helps address where BESS projects can be located, how much separation is needed between equipment and nearby buildings or property lines, what fire detection and ventilation systems may be required, and what emergency response planning should be in place.
UL 9540A	The national test method to evaluate how a BESS behaves during a thermal runaway event, a serious condition where a battery cell overheats and can generate additional heat in a self-reinforcing cycle. The test results can inform system design and spacing to help reduce the likelihood that, in the unlikely event of a fire, it spreads from one unit to another.



For local governments, the goal is not to interpret highly technical testing data themselves. The goal is to confirm that applicable testing information has been provided and reviewed by qualified professionals, such as the fire marshal, fire district or Authority Having Jurisdiction.

Together, these standards help ensure project design, local permitting, and emergency planning are informed by current fire-safety testing and real-world failure scenarios.

Emergency response plans, access routes, signage, shutoff information, monitoring responsibilities and training or site walk-throughs for local responders should all be part of the review process.

Local Planning Tools

Like any energy project, BESS facilities benefit from clear local expectations. When communities have standards in place, projects can be reviewed more consistently, concerns can be addressed earlier, and developers have a clearer understanding of what is expected.

Local governments have an important role in reviewing site design, emergency response coordination and decommissioning. The strongest projects begin with early coordination among developers, county officials, emergency responders, including fire, emergency management, and other public safety partners as appropriate, and neighbors.

Thoughtful siting and design can help communities support needed energy infrastructure while protecting local priorities.



Scan for sources

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SOURCES:

- University of Michigan - Planning & Zoning For Battery Energy Storage Systems A Guide For Michigan Local Governments
- National Renewable Energy Laboratory (NREL) – Battery Storage for Resilience
- American Clean Power (ACP) - NFPA 855: Improving Energy Storage System Safety
- Electric Power Research Institute (EPRI) - BESS Failure Incident Database
- National Fire Protection Association (NFPA) – NFPA 855
- American Clean Power, Modern Ordinance: Utility-Scale Battery Energy Storage Systems

QUESTIONS?

Contact renewables@renewablenw.org

