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Title: Energy storage air-cooled and water-cooled batteries

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Which cooling method is best for battery energy storage systems?

When it comes to managing the thermal regulation of Battery Energy Storage Systems (BESS), the debate often centers around two primary cooling methods: air cooling and liquid cooling. Each method has its own strengths and weaknesses, making the choice between the two a critical decision for anyone involved in energy storage solutions.

What is an air cooled battery system?

Air-cooled systems use ambient air flow - fans or natural convection - to carry heat away from the cells. They are simple and low-cost, since no coolant, plumbing or pumps are needed. Air cooling avoids leak hazards and extra weight of liquids. As a result, smaller or lower-power battery installations often rely on air-cooled designs.

What is a battery energy storage system?

Battery Energy Storage Systems (BESS) are essential for storing energy and ensuring its availability when needed. However, like all electronic systems, batteries generate heat during operation, especially when discharging or charging at high rates. Effective cooling is crucial to maintain the efficiency, safety, and longevity of these systems.

Can a battery pack be air cooled?

Park theoretically studied an air-cooled battery system and found that the required cooling performance is achievable by employing a tapered manifold and air ventilation. Xie et al. conducted an experimental and CFD study on a Li-ion battery pack with an air cooling system.

Nov 26, 2025&nbsp;&#0183;&nbsp;&nbsp;&nbsp;Discover EV battery cooling methods - air, liquid and direct refrigerant - and how each approach impacts pack temperature control, driving range, efficiency and battery life.

