

## A-Core Container

# Environmental impact of energy storage projects



## Overview

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How does energy storage capacity affect environmental impacts?

For indicators such as acidification potential, PM, and fossil fuel cumulative energy demand, , the reduction in environmental impacts due to the additional uptake of renewable generation only increased slowly as energy storage capacity was increased above the lower bound of capacity (Figure 22, Figure 23, and Figure 25).

Do energy storage environmental benefits outweigh environmental impacts?

Differences in the rate at which energy storage environmental benefits and impacts scale as more energy storage is deployed indicate the potential for a capacity level where the environmental impacts of these systems outweigh their benefits.

What are the environmental impacts of battery storage systems?

Secondly, environmental impacts arise throughout the lifecycle of battery storage systems, from raw material extraction to end-of-life disposal. Key issues include resource depletion, greenhouse gas emissions, and pollution from mining activities.

Can closed-loop pumped storage systems reduce environmental impacts?

This report focuses on potential environmental impacts: specifically, the degree to which impacts can be reduced by using closed-loop pumped storage systems as opposed to the traditionally more common open loop systems. Figure ES-1. Generic comparison of open-loop and closed-loop PSH projects. (Source: DOE 2019).

Why do we need energy storage systems?

The deployment of energy storage systems (ESS) plays a pivotal role in accelerating the global transition to renewable energy sources.

What is the purpose of energy storage engagements?

The purpose of these engagements was to inform staff involved in assessing plans for the deployment of energy storage technologies to support California's electricity decarbonization goals, specifically to provide information on flow batteries which may be used for long-duration storage functions.

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