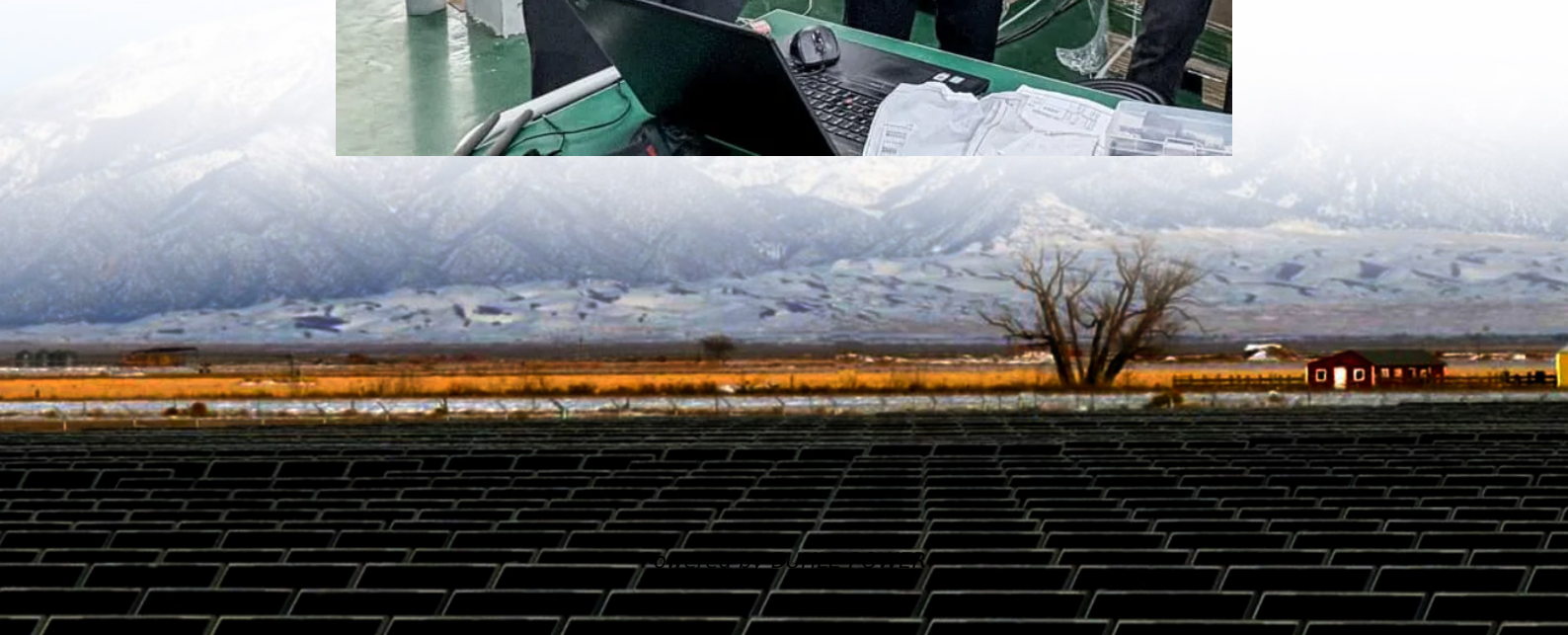


# **How large a scale does energy storage equipment have to be to be profitable**





## Overview

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Is energy storage profitable?

Energy storage is costly and, with these market conditions, generation alone without energy storage is the most profitable. With energy storage, there are energy losses due to the round-trip efficiency which contributes to the loss of revenue [ 31, 77 ]. The LCOE for GIES is higher than non-GIES.

How do business models of energy storage work?

Building upon both strands of work, we propose to characterize business models of energy storage as the combination of an application of storage with the revenue stream earned from the operation and the market role of the investor.

How much does gravity based energy storage cost?

publications to create low, mid, and high cost pro COST OF LARGE-SCALE BATTERY ENERGY STORAGE SYSTEMS PER KW Looking at 100 MW systems, at a 2-hour duration, gravity-based energy storage is estimated to be over \$ ,100/kWh but drops to approximately \$200/kWh at 100 hours. Li-ion LFP offers the lowest installed cost (\$/kWh) for battery systems across ma.

Why does energy storage cost more than non-Gies?

With energy storage, there are energy losses due to the round-trip efficiency which contributes to the loss of revenue [ 31, 77 ]. The LCOE for GIES is higher than non-GIES. This is due to a lower efficiency (i.e. energy output) for thermal energy storage, although the capital cost is lower.



## How large a scale does energy storage equipment have to be to be

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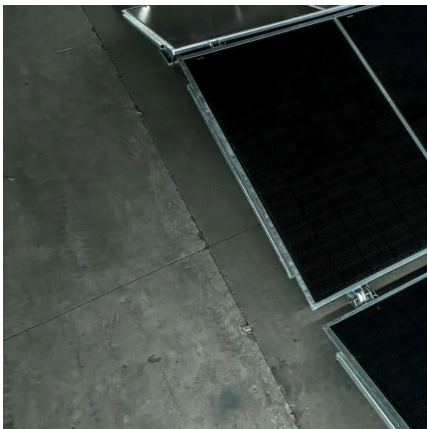


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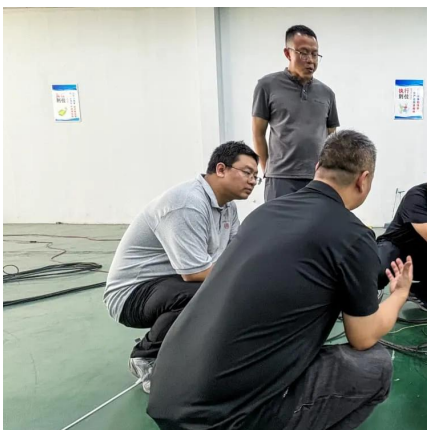
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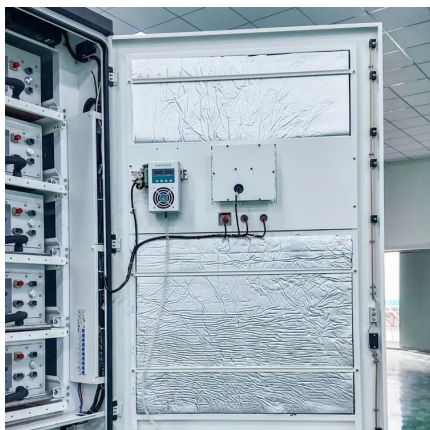


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