



FTMRS SOLAR

Cylindrical solar container lithium battery model cost performance





Overview

Current manufacturing efficiencies allow cylindrical cells to be produced at approximately \$98/kWh compared to \$121/kWh for prismatic alternatives – a 23% cost differential as of 2025. What is a modifiable cost model for lithium-ion battery cell chemistries?

Considering the available state-of-the-art bottom-up cost models, Wentker et al. presented a modifiable cost model to estimate cathode active material (CAM) costs for ten sorts of lithium-ion battery cell chemistries based on real-time prices of raw materials.

What is a battery cell design module?

The Battery Cell Design module calculates the undetermined dimensions—the diameter for cylindrical cells and the width for pouch and prismatic cells. Table 5. Battery parameters for the Cost Calculation module. Our selection adopts the widely recognized 18650 cells as the foundational benchmark for the cost assessment of cylindrical cells.

Does cell chemistry affect the per kWh cost of lithium-ion batteries?

The process-based cost model we construct for cylindrical lithium-ion cells shows that the cell chemistry has a significant impact on the per kWh cost of the batteries. For LMO batteries, with a low specific energy, the cylindrical cell format is too small and does not allow for the electrode thickness to increase sufficiently.

Which battery parameters are used for the cost calculation module?

Battery parameters for the Cost Calculation module. Our selection adopts the widely recognized 18650 cells as the foundational benchmark for the cost assessment of cylindrical cells. Pouch and prismatic cells are less standardized, but their dimensions were selected similarly to cylindrical cells.



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