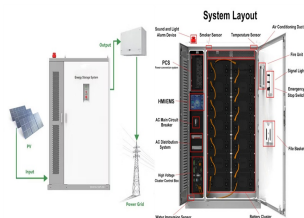


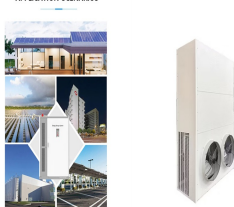
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LEVELIZED COST OF STORAGE LAZARD



II LAZARD's LEVELIZED COST OF STORAGE ANALYSIS???VERSION 8.0. 15: III LAZARD's LEVELIZED COST OF HYDROGEN ANALYSIS???VERSION 3.0. 24: APPENDIX . A Maturing Technologies: 29. 1 Carbon Capture & Storage Systems: 30. 2 Long Duration Energy Storage: 33. B LCOE v16.0: 36. C LCOS v8.0: 41. D LCOH v3.0: 43. APRIL 2023

APPLICATION SCENARIOS



lazard-levelized-cost-of-storage-v20 - Free download as PDF File (.pdf), Text File (.txt) or view presentation slides online. This document provides an analysis of the levelized cost of storage (LCOS) for various energy storage technologies and use cases. It defines 10 common use cases for energy storage and analyzes the LCOS based on the capital costs, operating expenses, ???



What Is Lazard's Levelized Cost of Storage Analysis? LAZARD's LEVELIZED COST OF STORAGE ANALYSIS???VERSION 3.0 I I L C O S M E T H O D O L O G Y , U S E C A S E S A N D T E C H N O L O G Y O V E R V I E W It clearly defines a set of use cases in terms of output and operating characteristics (e.g.,



Lazard's latest LCOE shows the continued cost-competitiveness of certain renewable energy technologies, and the marginal cost of coal, nuclear, and combined-cycle gas generation. Levelized Cost of Storage: Version 8.0. The central findings of our LCOS analysis reinforce what we observe across the Power, Energy & Infrastructure Industry



The mean levelized cost of energy of utility-scale PV technologies is down approximately 13% from last year and the mean levelized cost of energy of onshore wind has declined almost 7%. Lazard's latest annual Levelized Cost of Storage Analysis (LCOS 4.0) shows significant cost declines across most use cases and technologies, especially for

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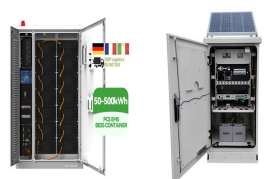
LCOE costs in future iterations of this report (albeit not necessarily higher relative costs). Lazard's latest annual Levelized Cost of Storage Analysis (LCOS 7.0) shows that year-over-year changes in the cost of storage are mixed across use cases and technologies, driven in part by the confluence of



Lazard's Levelized Cost of Energy ("LCOE") analysis addresses the following topics: High end incorporates 90% carbon capture and storage. Does not include cost of transportation and storage. (7) Represents the LCOE of the observed high case gas combined cycle inputs using a 20% blend of "Blue" hydrogen, (i.e., hydrogen produced



Lazard's latest annual Levelized Cost of Energy Analysis (LCOE 11.0) shows a continued decline in the cost of generating electricity from alternative energy technologies, especially utility-scale solar and wind. Lazard's latest annual Levelized Cost of Storage Analysis (LCOS 3.0), conducted with support from Enovation Partners, shows



What is Lazard's Levelized Cost of Storage Analysis? Lazard's Levelized Cost of Storage study analyzes the levelized costs associated with the leading energy storage technologies given a single assumed capital structure and cost of capital, and appropriate operational and cost assumptions derived from a robust survey of Industry participants



AND LEVELIZED COST OF STORAGE ANALYSES . NEW YORK, October 19, 2020 ??? Lazard Ltd (NYSE: LAZ) has released its annual indepth studies - Lazard's latest annual Levelized Cost of Storage Analysis (LCOS 6.0) shows that storage costs have declined across most use cases and technologies, particularly for shorter-duration applications, in part

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energy storage market continues to evolve, several potential sources of revenue available to energy storage systems have emerged; ultimately, the mix of available revenue streams for a particular energy storage system varies significantly across geographies. 1) Selected energy storage technologies are increasingly attractive for a number of



Lazard Releases Annual Levelized Cost of Energy and Levelized Cost of Storage Analyses October 19, 2020 NEW YORK --(BUSINESS WIRE)--Oct. 19, 2020--Lazard Ltd (NYSE: LAZ) has released its annual in-depth studies comparing the costs of energy from various generation technologies and the costs of energy storage technologies for different applications.



Lazard modelled the cost of storage on both a US\$/MWh and US\$/kW-year for a 100MW utility-scale front-of-the-meter (FTM) standalone battery storage project at 1-hour, 2-hour and 4-hour durations, as well as for behind-the-meter (BTM) commercial and industrial (C& I) standalone (1MW, 2-hour) and residential standalone (6kW, 4-hour).



Find out more about our French offices here. Lazard's office in Paris has been at the heart of the firm's history and culture since 1854. Lazard provides the full suite of the firm's services across Financial Advisory and Asset Management from Paris. Levelized Cost of Energy+; News & Announcements. All News & Announcements; Lazard in the



potentially disruptive role of hydrogen across a variety of economic sectors. Our LCOH builds upon, and relates to, our annual Levelized Cost of Energy ("LCOE") and Levelized Cost of Storage ("LCOS") studies. Given this breadth, we have decided to focus the analysis on the following key topics:

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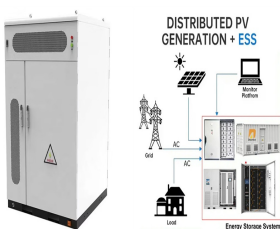
levelized cost of energy gas peaking fell of 2% and the mean levelized cost of energy of combined cycle gas has declined 4%. ??? The low end levelized cost of onshore wind-generated energy is \$29/MWh, compared to an average illustrative marginal cost of \$36/MWh for coal. The levelized cost of utility -scale solar is nearly identical



Levelized Cost of Storage. Lazard's latest annual Levelized Cost of Storage Analysis (LCOS 7.0) shows that year-over-year changes in the cost of storage are mixed across use cases and technologies, driven in part by the confluence of emerging supply chain constraints and shifting preferences in battery chemistry. Additional highlights from



Lazard's latest annual Levelized Cost of Energy Analysis (LCOE 11.0) shows a continued decline in the cost of generating electricity from alternative energy technologies, especially utility -scale solar and wind. Lazard's latest annual Levelized Cost of Storage Analysis (LCOS 3.0), conducted with support from



confidential Lazard's levelized cost of storage analysis ??? version 3.0 i introduction and executive summary 1 ii Lcos methodology, use cases and technology overview 3 iii Lazard's levelized cost of storage analysis 12 iv energy storage revenue streams 19 v illustrative energy storage value snapshots 25 appendix



Lazard's latest annual Levelized Cost of Energy Analysis (LCOE 14.0) shows that as the cost of renewable energy continues to decline, certain technologies (e.g., onshore wind and utility-scale solar), which became cost-competitive with conventional generation several years ago on a new-build basis, continue to maintain competitiveness with the marginal cost of selected existing ???

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Lazard's Levelized Cost of Storage analysis provides a transparent, logical methodology for comparing the cost of energy storage across distinct use cases for more than a dozen storage technologies. Utilities, third-party providers, ???



The results of our Levelized Cost of Storage ("LCOS") analysis reinforce what we observe across the Power, Energy & Infrastructure Industry???energy storage system ("ESS") applications are becoming more valuable, well understood and, by extension, widespread as grid operators begin adopting Key takeaways from Version 4.0 of Lazard



Lazard's latest annual Levelized Cost of Energy Analysis (LCOE 12.0) shows that, in some scenarios outlined below, alternative energy costs have decreased to the point that they are now at or below the marginal cost of conventional generation. Lazard's latest annual Levelized Cost of Storage Analysis (LCOS 4.0) shows significant cost



Lazard's latest annual Levelized Cost of Energy Analysis (LCOE 13.0) shows that as the cost of renewable energy continues to decline, certain technologies (e.g., onshore wind and utility-scale solar), which became cost-competitive with conventional generation several years ago on a new-build basis, continue to maintain competitiveness with the marginal cost of existing ???



Lazard's Levelized Cost of Storage study analyzes the levelized costs associated with the leading energy storage technologies given a single assumed capital structure and cost of capital, and ???

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Lazard's Levelized Cost of Storage ("LCOS") analysis(1) addresses the following topics: Introduction A summary of key findings from Lazard's LCOS v7.0 Lazard's LCOS analysis Overview of the operational parameters of selected energy storage systems for each use case ???

Commercial and Industrial ESS

Air Cooling / Liquid Cooling

- Budget-Friendly Solution
- Renewable Energy Integration
- Modular Design for Flexible Expansion



ii Lazard's levelized cost of storage analysis v5.0 For comparison purposes, this report evaluates six illustrative use cases for energy storage; while there may be alternative or combined/"stacked" use cases available to energy storage systems, the six use cases below represent illustrative current and contemplated



LAZARD's LEVELIZED COST OF HYDROGEN ANALYSIS Overview of Analysis Lazard has undertaken an analysis of the Levelized Cost of Hydrogen ("LCOH") in an effort to provide greater clarity to Industry participants on the ("LCOE") and Levelized Cost of Storage ("LCOS") studies. Given this breadth, we have decided to focus the