Compressed air energy storage patent

An integration of compressed air and thermochemical energy storage with SOFC and GT was proposed by Zhong et al. [134]. An optimal RTE and COE of 89.76% and 126.48 $/MWh was reported for the hybrid system, respectively. Zhang et al. [135] also achieved 17.07% overall efficiency improvement by coupling CAES to SOFC, GT, and ORC hybrid system.

@article{osti_1532111, title = {Systems and methods for efficient two-phase heat transfer in compressed-air energy storage systems}, author = {McBride, Troy O. and Bollinger, Benjamin R. and Bessette, Jon and Bell, Alexander and Kepshire, Dax and La Ven, Arne and Rauwerdink, Adam}, abstractNote = {In various embodiments, foam is compressed ...

A compressed air pumped hydro energy storage and distribution system includes a first reservoir of water and a second reservoir of air and water. An air pressure source, connected to the second reservoir, develops a pressure head in the second reservoir. ... While in accordance with the patent statutes only the best mode and preferred ...

Compressed air energy storage systems may be efficient in storing unused energy, but large-scale applications have greater heat losses because the compression of air creates heat, meaning expansion is used to ensure the heat is removed [[46], [47]]. Expansion entails a change in the shape of the material due to a change in temperature.

Compressed air energy storage (CAES) is an effective solution for balancing this mismatch and therefore is suitable for use in future electrical systems to achieve a high penetration of renewable energy generation. This study introduces recent progress in CAES, mainly advanced CAES, which is a clean energy technology that eliminates the use of ...

In various embodiments, energy is stored or recovered via super-atmospheric compression and/or expansion of gas in conjunction with substantially adiabatic compression and/or expansion from or to atmospheric pressure.

Compressed air energy storage is a promising technique due to its efficiency, cleanliness, long life, and low cost. This paper reviews CAES technologies and seeks to demonstrate CAES"s models, fundamentals, operating modes, and classifications. Application perspectives are described to promote the popularisation of CAES in the energy internet ...

Keeping the air at a constant temperature during compression, storage, and expansion yields a more efficient storage cycle. The new patent covers the use of a liquid spray injected into air continuously during compression or expansion and solidifies SustainX"s position as a leader in the field of compressed-air energy storage.

Compressed air energy storage patent

Patent: Systems and methods for efficient two-phase heat transfer in compressed-air energy storage systems ... patent: July 2000: Compressed Air Energy Storage System Utilizing Two-Phase Flow to Facilitate Heat Exchange. Fong, Danielle A.; Crane, Stephen E.; Berlin, JR., Edwin P.

A hybrid compressed air energy storage system is provided. A heat exchanger 114 extracts thermal energy from a compressed air to generate a cooled compressed air stored in an air storage reservoir 120, e.g., a cavern. A heat exchanger 124 transfers thermal energy generated by a carbon-neutral thermal energy source 130 to cooled compressed air conveyed from ...

@article{osti_1531902, title = {High-efficiency heat exchange in compressed-gas energy storage systems}, author = {Bollinger, Benjamin and Magari, Patrick and McBride, Troy O.}, abstractNote = {In various embodiments, efficiency of energy storage and recovery systems employing compressed air and liquid heat exchange is improved via control of the system ...

Compressed air energy storage means the use of the dump energy of an electric power system at the valley load wherein a motor drives an air compressor 102 to compress air into an air storage chamber 104, for example, a closed large-capacity underground cave, and thus non-storable electric energy is converted into storable barometric potential energy of compressed air and ...

The compressed air energy storage system (CAES) is one of the most promising technologies of the field of smart grid and poly-generation in the near future [4], ... Four patents related to storage system based on liquid piston and scroll compressor/expander technology have been filed [19]. Enairys Powertech first non-commercial prototype was ...

pressed air to generate a cooled compressed air stored in an air storage reservoir 120, e.g., a cavern . A heat exchanger 124 transfers thermal energy generated by a carbon - neutral thermal energy source 130 to cooled compressed air con veyed from reservoir 120 to generate a heated compressed air . An expander 140 is solely responsive to the ...

Thermal energy storage system using compressed air energy and/or chilled water from desalination processes patent-application, October 2007 Enis, Ben M.; Lieberman, Paul US Patent Application 11/585023; 20070234749

(12) Patent Application Publication (10) Pub. No.: US 2011/0094212 A1 Ast et al. (43) Pub. Date: Apr. 28, 2011 (54) COMPRESSED AIR ENERGY STORAGE ... compressed air energy storage (CAES) system is alternately operable in a compression mode and an expansion mode and

Web: https://www.taolaba.co.za