Hotspots in energy storage development

Do research hotspots evolve in underground thermal energy storage?
Existing reviews on underground thermal energy storage (UTES) are often fragmented and lack analysis of the spatial-temporal evolution of research hotspots. This study aims to provide an objective and comprehensive analysis of the developmental trajectory and research trends in the global UTSES field.

Is underground thermal storage a hotspot?
Underground thermal storage primarily depends on geothermal carriers like underground hot rock,hot water,or steam [13,255]. Currently,research on underground thermal energy storage media is exploring materials to enhance energy efficiency: the burstiness index of "PCM" reached 9.12 (post-2020),signifying PCM as the latest hotspot.

Which research topics are emerging hotspots in the field of est?
In the period from 2019 to 2021, two new research topics were added: lithium battery solid electrolyte fused metal technology and research on new energy vehicle battery charging systems. This indicates that these two technology topics may become emerging hotspots in the field of EST.

How has borehole thermal-storage technology evolved?
Moreover, it forms a development pattern of synergistic evolution across multiple technical pathways. Currently, the research focus of borehole thermal-storage technology has gradually shifted from early-stage environmental adaptability to renewable energy coupling, numerical simulation, and intelligent integration.

How are energy storage research centers obtained?
The research centers on the field of energy storage are obtained through the analysis of the co-citation network and co-occurrence network. In Section 3,different types of energy storage are introduced in terms of development history,working principle,key materials,technical specifications,applications,and future development.

How is research hotspot evolution based on visualization software?
Following rigorous data refinement and deduplication, a final corpus of 7,705 journal articles is obtained. Subsequently, visualization software is used to draw keyword co-occurrence networks, research hotspot evolution processes, and burst term mappings to identify research hotspots and trends.

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