**COMPRESSED AIR ENERGY: WASTE HEAT UTILIZATION**

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**ABSTRACT**

Large scale penetration of renewable energies such as wind and solar into the electric grid is complicated by their intermittency. Energy storage systems can mitigate these fluctuations by storing off-peak energy for use at peak-demand times. Compressed air energy storage (CAES) is one of the most promising storage technologies due to the large amount of energy that can be stored at an economical cost. We evaluate the feasibility of improving the economics of CAES by distributing compressors near heat loads to enable recovery of the heat of compression to Distributed CAES (DCAES) is more efficient; however, it has higher capital costs due to the compressed air pipeline required between distributed compressors and the storage site. We evaluate the project economics of DCAES in a hypothetical scenario with a variable electric and heat load. The size and dispatch of a generation fleet composed of a Non conventional energies (solar and wind), CAES or DCAES plant and conventional gas turbines are optimized to satisfy the annual electricity load at an hourly resolution at the lowest total cost.

KEYWORDS: CAES, DCAES, COMPRESSION