

Abstract

Abandoned, decommissioned, and early retired underground coal mines in southern and northwestern West Virginia can be reclaimed for the construction of grid scale, long duration energy storage. This report outlines analytical energy capacity models for three gravity energy storage technologies. These models are then applied to mine shafts in West Virginia to determine energy storage capacity of the land using mine shaft dimensions, operational status, and extant infrastructure as inputs. The case study reveals an opportunity for at least 72 megawatt hours of energy storage via adoption of gravity energy storage systems in existing underground coal mines.