

What should be considered after a geologic energy storage assessment?

Any follow-on economic or engineering analysis may be considered after the assessment. Initial work on a USGS assessment of geologic energy storage could focus on natural gas and hydrogen (chemical), compressed air and solid-mass gravity (mechanical), and geothermal energy (thermal) storage methods ( table 1 ).

How can we assess geologic subsurface energy storage options?

The initial research goal is to compile a report containing recommendations on the geologic datasets needed and the key process steps required to build a probabilistic assessment methodology to assess various geologic subsurface energy storage options.

What is geologic energy storage?

Geologic energy storage is a practical solution that can store 100 or more hours of energy. Batteries are primarily designed for storing electrical energy, but geologic storage methods have an advantage of being able to store chemical and thermal energy (for space heating, for example) directly without conversion to electricity.

How do we assess geologic energy storage?

Initial work on a USGS assessment of geologic energy storage could focus on natural gas and hydrogen (chemical), compressed air and solid-mass gravity (mechanical), and geo-thermal (thermal) storage methods (table 1). Table 1 shows likely combinations of geologic energy storage methods and geologic settings for these initial assessments.

Does geologic energy storage still exist?

Much of the technology for geologic energy storage is still undergoing research and development (Crotono and others, 2017; Matos and others, 2019), although several industrial-sized underground storage projects are already operating in the United States and world-wide (fig. 1).

What geologic settings are used for energy storage?

Some applications may use natural, permeable rock formations, but others rely on new or existing resource-extraction activities, such as mining or gas production. Different geologic settings for energy storage include the following: Freshwater or saline aquifers.

As part of U.S. Geological Survey's (USGS) efforts to identify and assess geothermal energy resources of the US, a three-dimensional (3D) geologic and thermal model has been constructed for the Williston Basin, ...

An electrical grid that uses long duration energy storage projects with over 100 hours of stored power could result in the greatest reduction in electricity costs (Sepulveda and others, 2021). Geologic energy storage is a practical solution ...

The Utah Geological Survey (UGS) was awarded a \$1.1 million cooperative agreement from the U.S. Department of Energy (DOE) Office of Fossil Energy & Carbon Management to study the ...

Greenhouse gases in the atmosphere retain heat from the Sun, allowing plants and animals to flourish. As the amount of these gases change, so does the atmosphere's effectiveness at ...

In addition to generating electricity, low-temperature geothermal resources and thermal energy storage in geological reservoirs may offer potentially large sources of energy for heating and ...

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