

Can long-duration energy storage (LDEs) meet the DoD's 14-day requirement?

This report provides a quantitative techno-economic analysis of a long-duration energy storage (LDES) technology, when coupled to on-base solar photovoltaics (PV), to meet the U.S. Department of Defense's (DoD's) 14-day requirement to sustain critical electric loads during a power outage and significantly reduce an installation's carbon footprint.

What is the long-duration energy storage (LDEs) joint program?

The U.S. Department of Energy (DOE)/U.S. Department of Defense (DOD) Long-Duration Energy Storage (LDES) Joint Program is a partnership between DOE's Office of Clean Energy Demonstrations (OCED) and DOD's Office of the Deputy Assistant Secretary of Defense for Energy Resilience and Optimization (ODASD (ER&O)).

What is long-duration energy storage (LDEs)?

The Advanced Research Projects Agency-Energy (ARPA-E), through its Duration Addition to electricity Storage (DAYS) program (2), has invested in long-duration energy storage (LDES) systems with a focus on meeting the future needs of the grid. One such technology, developed by Antora Energy (3), stores thermal energy in carbon blocks.

What is DoD's energy resilience goal?

DoD's installation energy resilience goal is maintaining electric power for all critical loads up to 14 days in the event of a grid outage(5). No backup power system has a 100% probability of providing power. Power may not be provided because of limited fuel availability, equipment failures, insufficient DER capacity, or poor solar conditions.

How much energy does the DOD use?

Energy is essential for DoD's installations, and DoD is dependent on electricity and natural gas to power their installations. In fiscal year 2022 (20), DoD's installations consumed more than 200,000 million Btu (MMBtu) and spent \$3.96 billion to power, heat, and cool buildings.

How will energy storage impact resiliency?

In addition, the large energy storage expected to be required to meet DoD resiliency goals will result in a BESS that has no need to use most of its SOC while grid tied to yield economic value. A higher minimum SOC will lead to a higher survival probability at 14 days, and a lower SOC minimum will lead to

Article 2 Civil air defense is a component part of national defense. In light of the need of national defense, the State mobilizes and organizes the masses to take protective measures for preventing or minimizing damage caused by air raid. For civil air defense, the guidelines of making long-term preparation, giving priority to the building of ...

The phase change energy storage floor heating system (PCFHS) enjoys improved performance of storing and releasing thermal energy and plays a significant role in optimizing heating with non ...

To deploy renewable energy, it is necessary to first have an energy storage system that can support these sources. Thus, this paper proposes a review on the energy storage application ...

Energy Storage: Resiliency for Military Installations. Golden, CO: National Renewable ... Department of Defense's (DoD's) 14-day requirement to sustain critical electric loads during a ... Patuxent River Naval Air Station (NAS) Maryland : Navy . 52,000 : Holloman Air Force Base (AFB) New Mexico : Air Force . 13,800 :

Beijing Municipal Civil Air Defense Office should further enhance its supervision towards the construction of civil air defense projects, strictly manage civil air defense projects in accordance with laws, establish and better management system ne-tune and perfect utilization standards and administrative provisions, promote fine management approach based on ...

Energy Office of Energy Efficiency and Renewable Energy Operated by the Alliance for Sustainable Energy, LLC. NREL/FS-7A40-74847 o October 2019 NREL prints on paper that contains recycled content. Table 1. The "Five Rs" of Energy System Resilience. Table adapted from Air Force Civil Engineer Center. Characteristic Qualities

The DOD's Environmental Security Technology Certification Program and the Defense Innovation Unit, in partnership with OCED, awarded nearly \$19 million in combined funds to CellCube Inc. to install a 500 kW ...

What is Civil Defense Shelter and its Function?A shelter is a structure designed to protect people and equipment against the harmful effects of blast and other types of threats according to purposes it's been built for. There are different types of shelters, and they can be categorized according to needed protection level (class), space and configuration demands, ...

10) Responsible for the organization and coordination of civil air defense science and technology research and academic exchanges; organize, coordinate and direct education and training of civil air defense in Shanghai; coordinate with community, schools, enterprises and institutions to develop civil defense work; guide and check community and ...

Founded on Dec. 1, 1941, Wilson launched his perfected program: the Civil Air Defense Services (CADS). That summer, tasked by Fiorello H. LaGuardia (New York mayor and director of the federal Office of Civilian Defense and also a World War I aviator), Wilson, publisher Thomas H. Beck and newspaperman Guy P. Gannett proposed Wilson's CADS ...

In order to ensure the normal operation of the air conditioning system of the civil air defense projects, it is necessary to find out effective ways to enhance the heat storage ...

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Scientific and reasonable satisfaction evaluation is an excellent way to understand the effects of building (structure) renovation and public satisfaction. This study presents a satisfaction evaluation of civil air defense ...

The mode for developing civil air defense should also be optimized, and a modern civil air defense should be built. Xi stressed that border, sea and air defense involves multiple departments and levels across both military and civilian sectors. It is imperative to strengthen the centralized and unified leadership of the CPC Central Committee ...

Assuming that the second underground floor has protective functions and half of the stations can be used as general protection units, which accommodates 800-1000 people (conservatively taking the capacity of a unit ...

Second, we must clarify the identity of energy storage as a market entity. This includes defining the procedures for establishing energy storage projects, including fire safety ...

The service environment of civil air defense engineering structures is relatively harsh, and the corrosion of steel bars is the main reason for reducing the durability of concrete structures in civil air defense engineering. A hybrid ...

For example, the Ground Based Air Defense (GBAD), being developed by the Office of Naval Research, mounts a high-energy laser on a ground vehicle Since energy storage is not expected to significantly alter the ability to generate more damage, it is ranked low on lethality. Finally, examining new concepts for nuclear fusion reactors, these ...

New Energy Storage Policies and Trends in China. Energy storage development in China is seeing new trends emerge. First, energy storage technology is a multi-disciplinary, multi-scale integration of science and technology. ... facility approval, civil air defense approval, and other procedures. Grid companies must also clarify the procedures ...

The U.S. Department of the Air Force (DAF) strives to accelerate the deployment of resilient energy solutions at its installations worldwide. Through its Finance First prototype initiative, DAF is seeking to leverage the collective ingenuity of private sector partners to propose innovative business processes and financing structures that will compress project timelines and provide ...

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Using the Air Force's "5 R" Framework (Table 1), NREL identified a range of mitigation strategies that increase multiple characteristics of resilience. For example, diesel ...

Grey correlation theory is an uncertainty analysis method, which can find the relevance of various factors studied through certain data processing in incomplete information and find the main influencing factors. In order to ...

The UUS development in Shanghai can be divided into three phrases. The period from 1950 to 1970s was the first phase of UUS development with the civil air defense projects as representative (Qiao and Peng 2016). At that time, these civil air defense projects mostly existed independently and failed to form underground space network.

Battery Energy Storage Systems (BESS) use electricity to drive a reversible chemical reaction to store power. This process is then reversed to inject power into a system. ...

DECo RFI: The Air Force Office of Energy Assurance is seeking information to shape its competitive selection of a Consortium Manager to stand-up and manage the DECo, a public-private consortium that can work at the scale and speed necessary to help the Department of the Air Force cost-effectively address the problem of obtaining 99.9% energy ...

For general purpose mobile land based power provisions, we are supporting the transition to a more efficient and lower carbon footprint system to include; energy storage and power/data management modules, in addition to the potential to utilise more sustainable fuels in place of diesel, integrating renewable energy sources such as solar.

First market "pivot" away from cost towards performance to satisfy military needs? - Where does DOD perceive a need for advanced energy technologies? - How does DOD ...

Cummins Inc. (NYSE: CMI) will debut the Tactical Energy Storage Unit during the 2019 Association of the United States Army (AUSA) show at the Washington Convention Center, October 14 - 16. The new Tactical Energy ...

The civil air defense works are underground protection spaces built in case of war. At present the amount of these works has reached a considerable scale and thorough exploitation and reasonable ...

MOUNTAIN VIEW, CA (October 3, 2023) -- Decentralized energy resiliency empowers the Department of Defense (DoD) to sustain a wide range of operations--from humanitarian or natural disaster assistance to countering ...

[China Railway 14th Bureau acquired Shandong Civil Air Defense Building] <p>On January 18, 2021, Shandong Civil Air Defense Architectural Design Institute Co., Ltd. completed the procedures for the change

of industrial and commercial registration equity. After the change, China Railway 14th Bureau Group Co., Ltd. holds 51% of the shares, and Shandong Guohui ...

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