

This study presents a techno-economic analysis for implementation of a hybrid renewable energy system at the South Pole in Antarctica, which currently hosts several high-energy physics experiments with nontrivial power needs.

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Firstly, the reliability-oriented planning model applicable to the Antarctic integrated energy system is constructed. In particular, the improved Gaussian mixture model is introduced to accurately describe the probabilistic characteristics of renewable energy in Antarctica considering its unique geographical location and operating environment.

The Princess Elisabeth Antarctica Research Station has a smart microgrid designed by research centre and technical service provider Laborelec, and an automated energy management system designed...

Before the introduction of renewable energy systems, Australian stations required 2.1 megalitres of diesel fuel every year for power and heating. Burning this fuel emitted around 5,500 tonnes of carbon dioxide into the Antarctic environment. ...

PV Tech Power's Simon Yuen talks to Slovenian solar company Bisol and the International Polar Foundation about features of renewable energy production at the research station which was ...

Towards a greener Antarctica: A techno-economic analysis of renewable energy generation and storage at the South Pole ANL: Susan Babinec (energy storage), Ralph Muehlsein (solar modeling & system design), Amy Bender (CMB exp, S. Pole), NREL: Nate Blair (economics), Ian Baring-Gould (wind modeling), Xiangkun Li (system optimization), Dan Olis

Before the introduction of renewable energy systems, Australian stations required 2.1 megalitres of diesel fuel

every year for power and heating. Burning this fuel emitted around 5,500 tonnes of carbon dioxide into the Antarctic environment. Using alternative, renewable energy systems has many benefits including:

This article showcases a range of small and large scale energy efficiency and renewable energy deployments at Antarctic research stations and field camps. Due to the cold and harsh environment, significant amounts of fuel are needed to support humans working and living in Antarctica.

AB - This presentation covers existing PV and renewable examples for the South Pole, challenges, and the results of the ANL+NREL project of a techno-economic analysis to deploy renewables to support the CMB-S4 telescope. KW - battery. KW - bifacial_radiance. KW - clean energy. KW - long-term batteries. KW - renewable. KW - reOPT. KW - solar panels

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