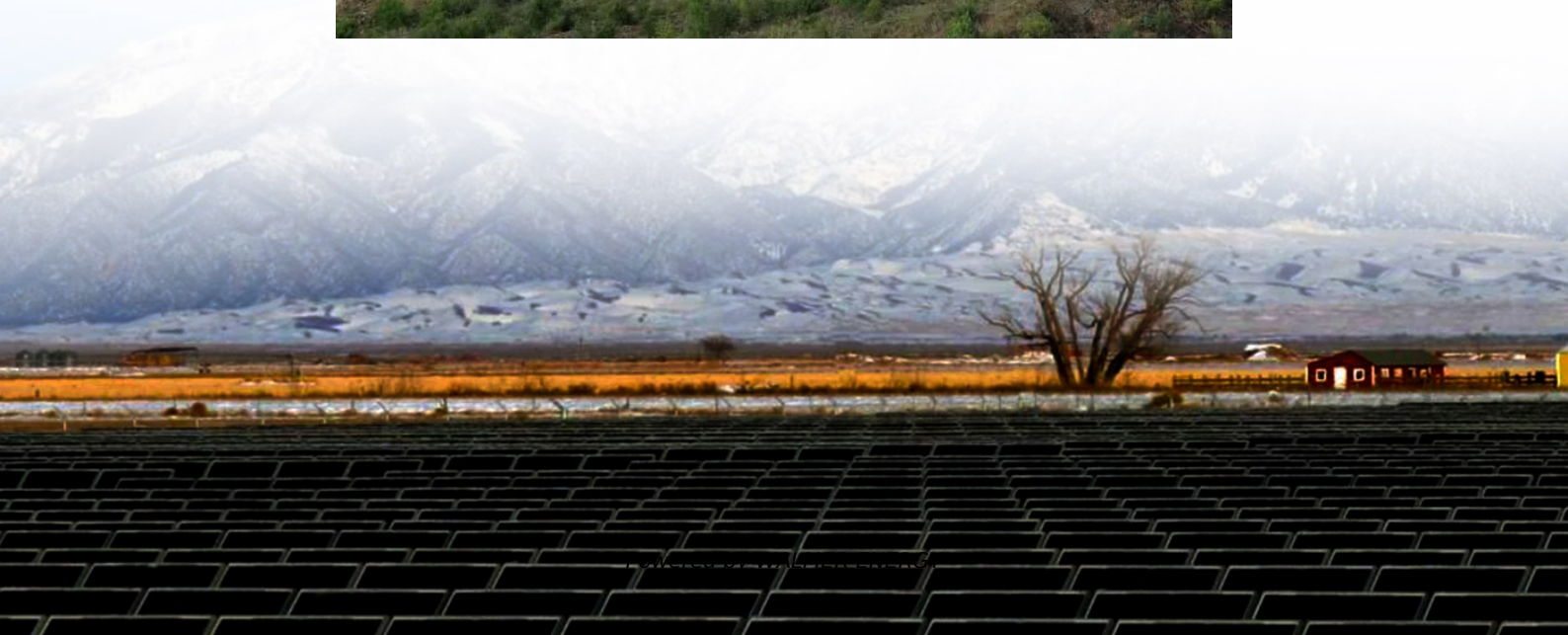


Small-scale power storage





Overview

A dynamic, techno-economic model of a small-scale, 31.5 kWe concentrated solar power (CSP) plant with a dish collector, two-tank molten salt storage, and a sCO₂ power block is analysed in this study. Plan.

What is a small-scale CSP system?

The small-scale CSP system with TES in this work offers a reliable and near-continuous green electricity supply for remote, off-grid applications where the use of backup fossil-fuel generators needs to be minimised. These systems are competitive with PV-battery systems for locations with high DNI resource.

Where can I find a small-scale dish system?

The small-scale dish system and component models are available in the open source package SolarTherm —a Modelica-based simulator for concentrating solar thermal (CST) systems that is developed and maintained by the researchers at the Australian National University (ANU). The model is called Small_Scale_Dish_system.mo.

What happens if solar storage is undersized?

An undersized storage would lead to curtailment of solar energy provided by the collector-receiver due to the storage being full, and consequently a less-than-optimal amount of electricity being generated throughout the year.

How can plant solar multiple and storage hours be optimised?

Plant solar multiple and storage hours are optimised using a multi-objective genetic algorithm to minimise the levelised cost of electricity (LCOE) and maximise the capacity factor (CF). The optimal LCOE is found to be ranging from 122.7 USD/MWh_e to 217.8 USD/MWh_e when using optimistic and pessimistic power block cost assumptions.



Small-scale power storage

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