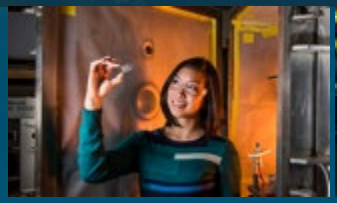
ENERGY STORAGE FOR GRID RESILIENCE

Anza Electric Cooperative

Energy Storage Project

DOE/OE ENERGY STORAGE PEER REVIEW 2018



PRESENTED BY

Frank Currie

SAND2018-10642 C

Sandia National Laboratories is a multimission laboratory managed and operated by National Technology & Engineering Solutions of Sandia, LLC, a wholly owned subsidiary of Honeywell International Inc., for the U.S. Department of Energy's National Nuclear Security Administration under contract DE-NA0003525.

ANZA ELECTRIC COOPERATIVE ENERGY STORAGE

Participants

- National Rural Electric Cooperative Association (NRECA)
- Arizona Electric Power Cooperative (AEPCO)
- Anza Electric Cooperative
- Sandia National Labs - Frank Currie, Tu Nguyen, Dan Borneo

ANZA ELECTRIC COOPERATIVE ENERGY STORAGE

Objectives

- Provide an assessment of using battery storage to **deferring transmission upgrades**
- Provide an assessment of using energy storage to **increase resilie**nce

ANZA ELECTRIC COOPERATIVE ENERGY STORAGE

The Issue:

Anza is located in southern California within the San Bernadino Forest

It's territory is served from Southern California Edison (SCE) via a single circuit line rated for only 19 MW.

Whenever that line is out of service, all Anza customers lose power.

How often does do Anza customers lose power?

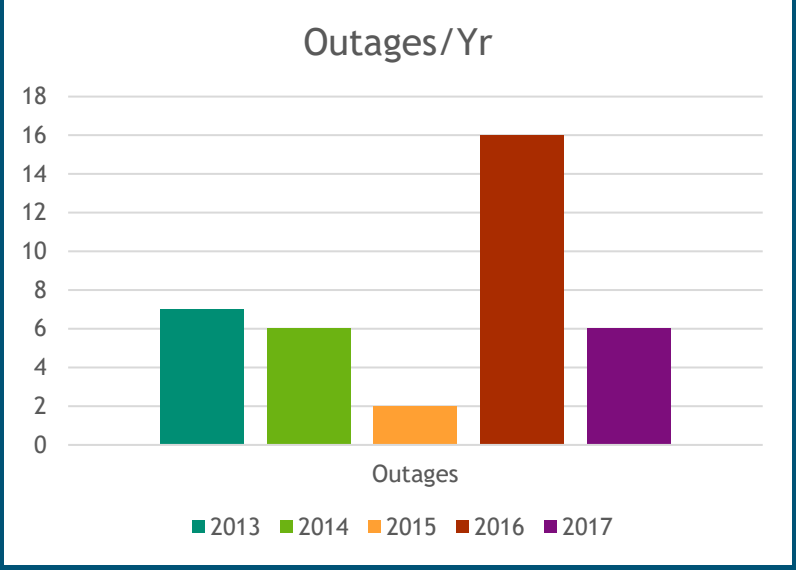
ANZA ELECTRIC COOPERATIVE ENERGY STORAGE

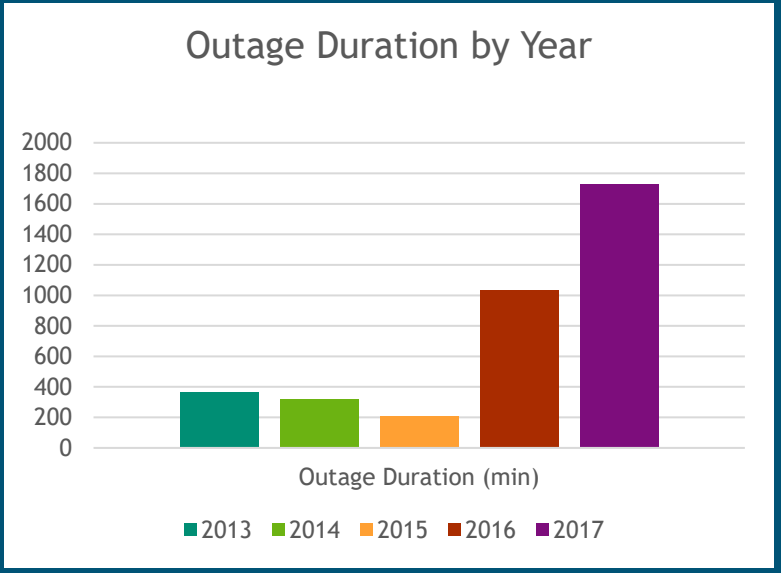
SAIDI Information

(System Average Interruption Duration Index)

These outages are ALL due to problems in SCE. And all of these outages knocked out ALL of Anza.

On top of this, load is growing and will soon exceed line capacity





ANZA ELECTRIC COOPERATIVE ENERGY STORAGE

So what has Anza done so far?

- Rebuilt sections of line that accounted for 14% of outage duration since 2013
- Installed a remote automatic recloser on the Resort line that would have reduced outage duration by 23%
- Upgraded lines to achieve higher thermal capacity

Currently at a 19 MW capacity into Anza.

The next step is a $20+ million dollar line addition, or…

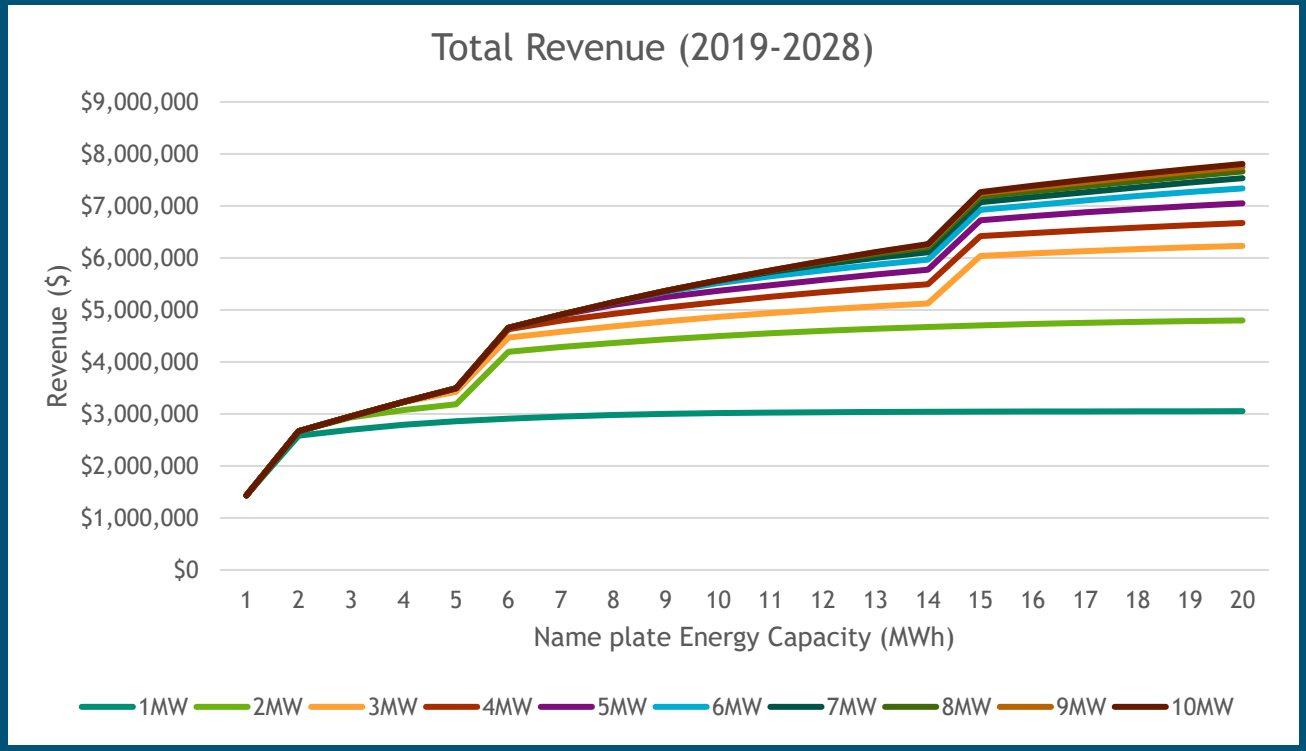
ANZA ELECTRIC COOPERATIVE ENERGY STORAGE

Rather than spend $20+ million dollars to increase capacity into Anza, they have decided to explore using energy storage to defer transmission upgrades and to feed critical loads duration outages.

Sandia looked and the potential benefits of transmission deferral, energy arbitrage opportunities, and direct costs to Anza due to outages.

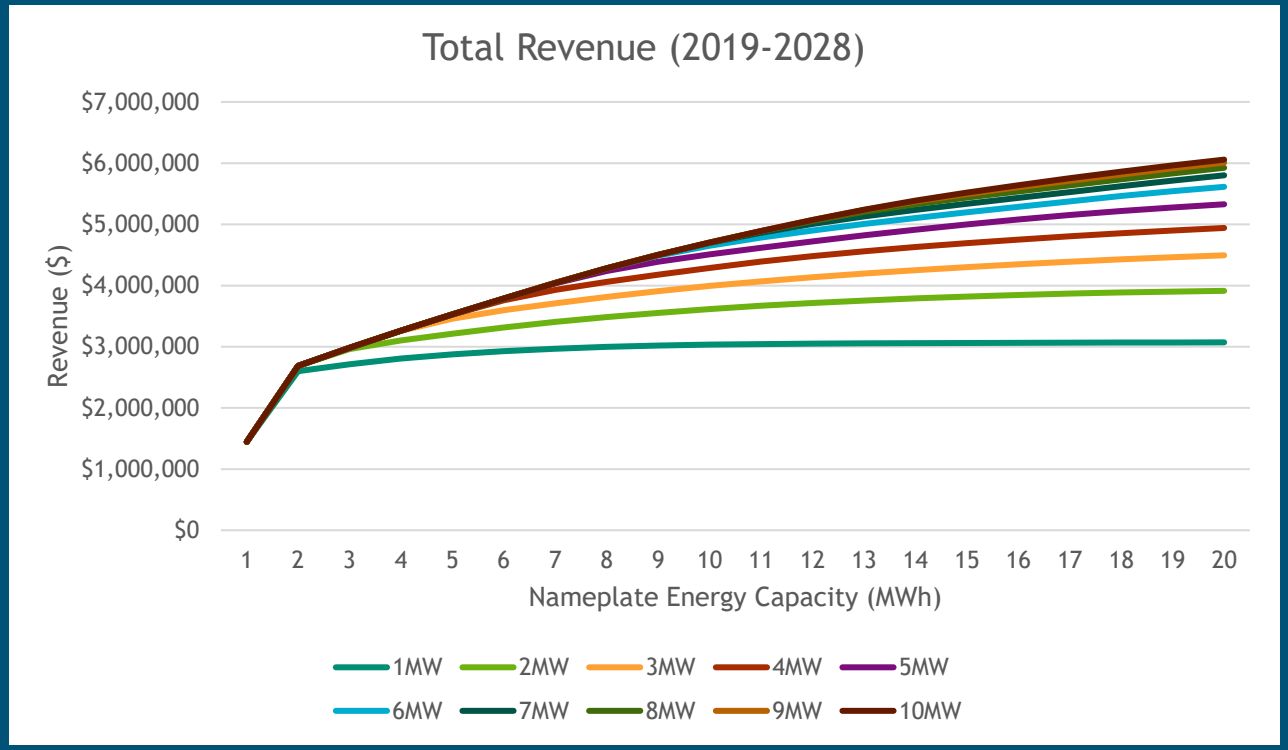
Three load growth scenarios were examined to bound revenue expectations: low, medium, high for the years from 2018 to 2028.

ANZA ELECTRIC COOPERATIVE ENERGY STORAGE



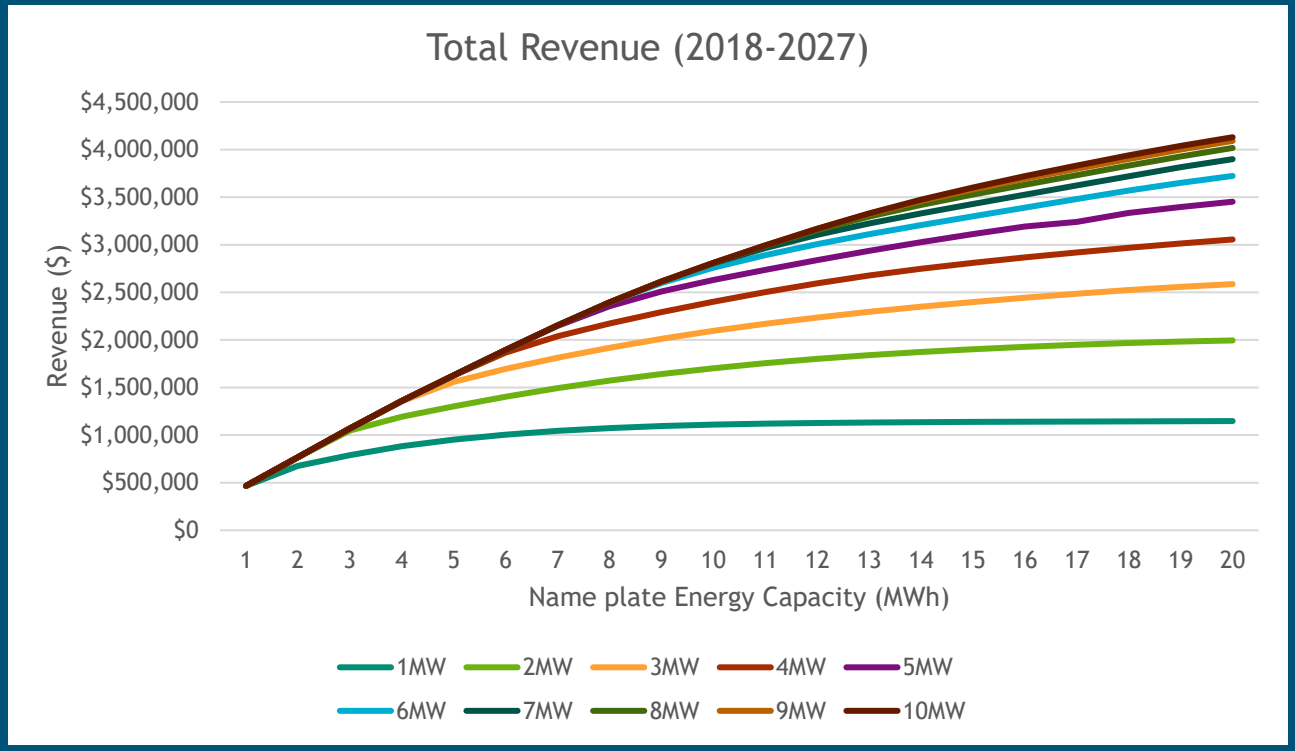
High load growth scenario

ANZA ELECTRIC COOPERATIVE ENERGY STORAGE



Medium load growth scenario

ANZA ELECTRIC COOPERATIVE ENERGY STORAGE



Low load growth scenario

ANZA ELECTRIC COOPERATIVE ENERGY STORAGE

Summary

- The majority of potential savings comes from transmission deferral, although…
- There was no transmission deferral opportunity in the low load growth scenario.
- Any energy capacity in the medium growth scenario pushed transmission additions back by a maximum of 2 years.
- In the high load growth scenario, the minimum size Energy Storage System that deferred transmission by 3 years was 2 MW/6 MWh, and a maximum of 4 years of deferral could be achieved with a 3 MW/15 MWh system.

ANZA ELECTRIC COOPERATIVE ENERGY STORAGE

Next Steps

The Sandia analysis has shown that the best size for an energy storage solution is about 2 MW and between 4 and 8 MWh.

Anza is currently working with project participants and stakeholders to develop an RFP to bid on several storage size options so that a final selection can be made…

THANK YOU!

Project Team
Tu Nguyen, Ben Schenkman,
Frank Currie, and Dan Borneo

fmcurri@sandia.gov

Department of Energy, Office of Electricity
Grid Energy Storage Program
managed by
Dr. Imre Gyuk