

Stafford Hill: Tying the Values Together

A Department of Energy Project



EESAT September 2015
Chris Larsen

Rutland, VT

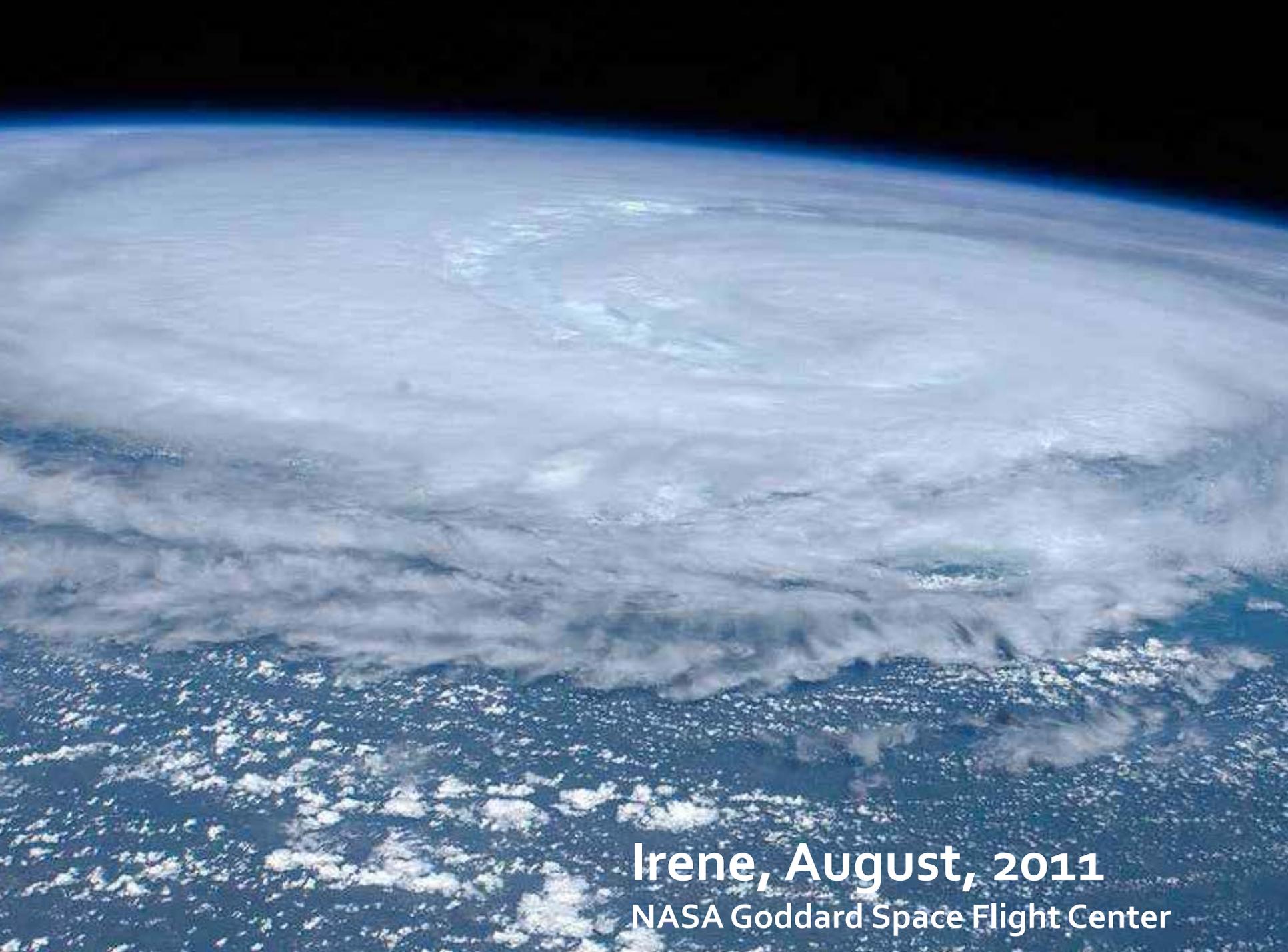


THE
NEW YORKER



*"....when the site flickers on,
[Rutland] will be the most solarized
in northern New England."*

**- Bill McKibben, The New Yorker,
June 29, 2015**



Irene, August, 2011
NASA Goddard Space Flight Center

The Catalyst



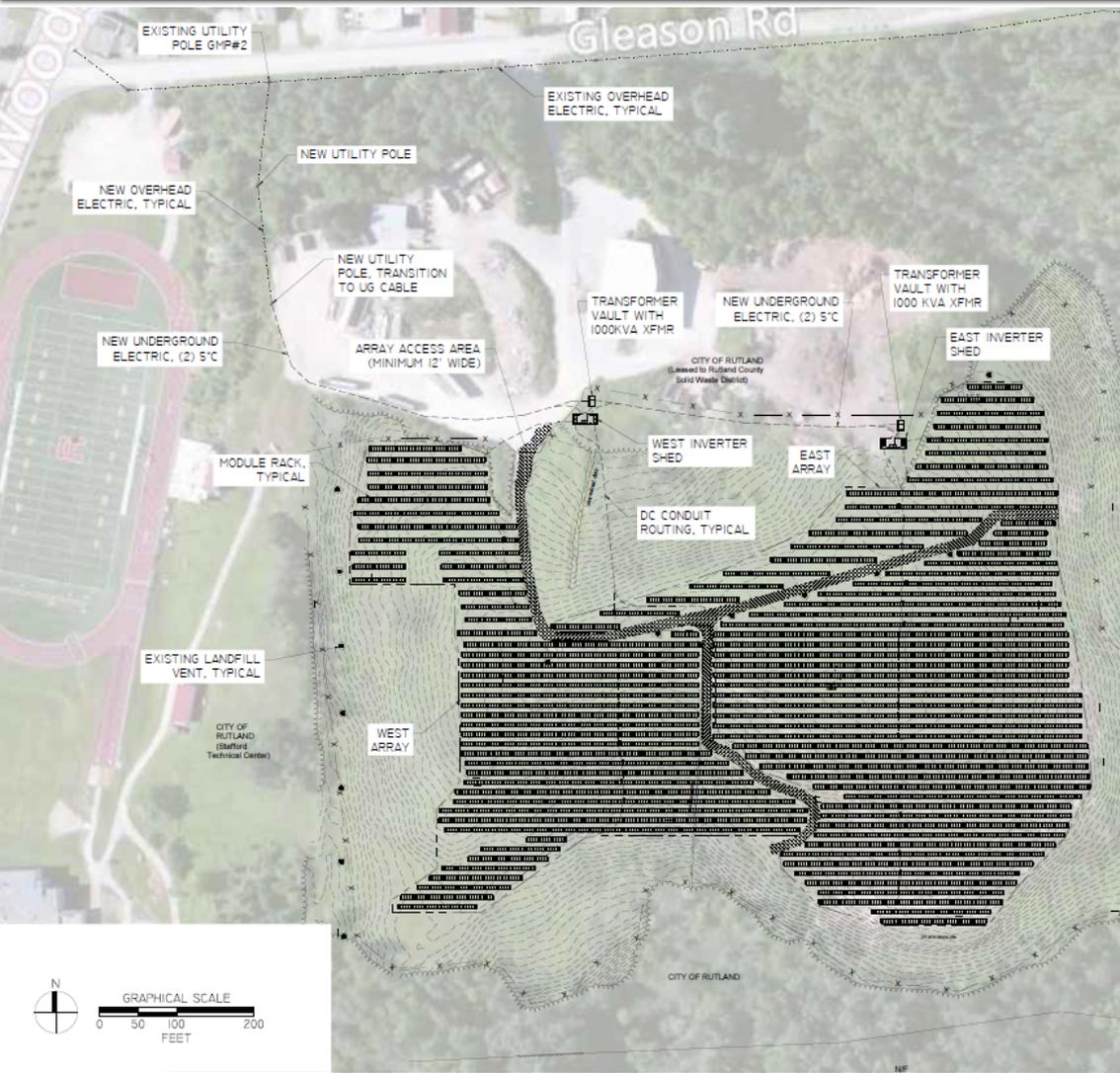
- Prolonged Outages
 - 73,000 customers
 - 3 – 10 days
- Infrastructure
 - 480 bridges damaged
 - 13 communities without passable roads in or out

The Response: Stafford Hill Project



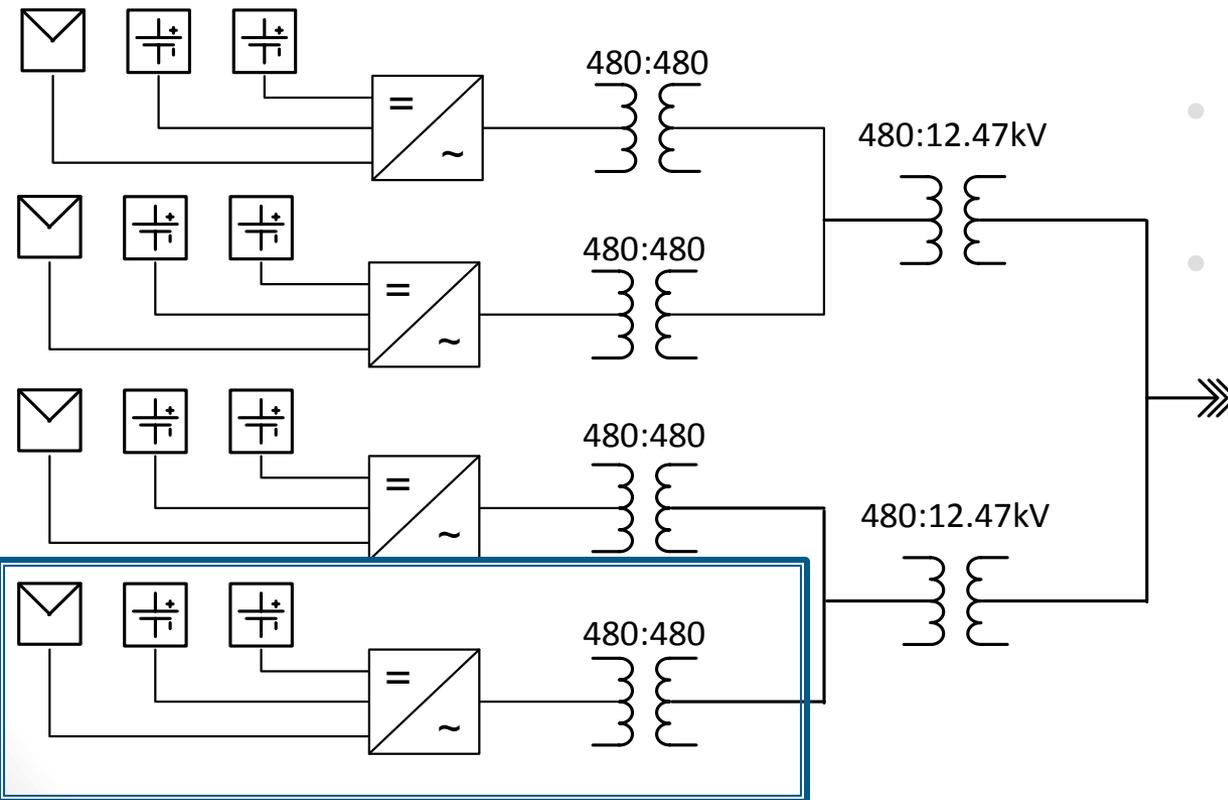
- Stafford Hill
- Rutland, VT
- High school
- Emergency shelter
- Landfill

The Approach



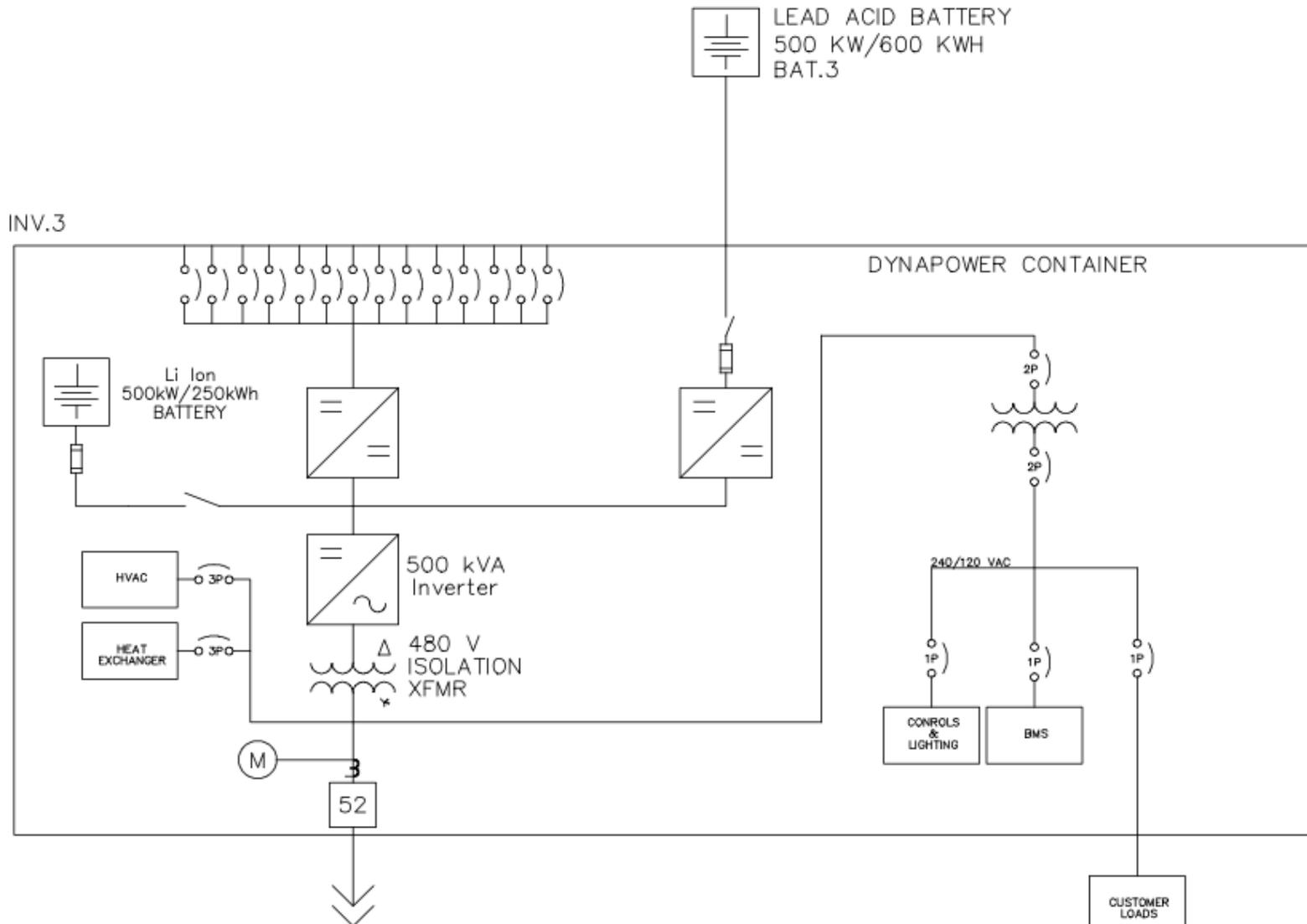
- 2,000 kW solar
- 7,700 panels
- Brownfield construction
- Hybrid Storage
 - Power Battery
 - Energy Battery

The Solution



- Three port bi-directional inverters
- Each parallel system
 - 500 kW PV
 - 500 kW / 222kWh Li-Ion
 - 500 kW / 600kWh VRLA

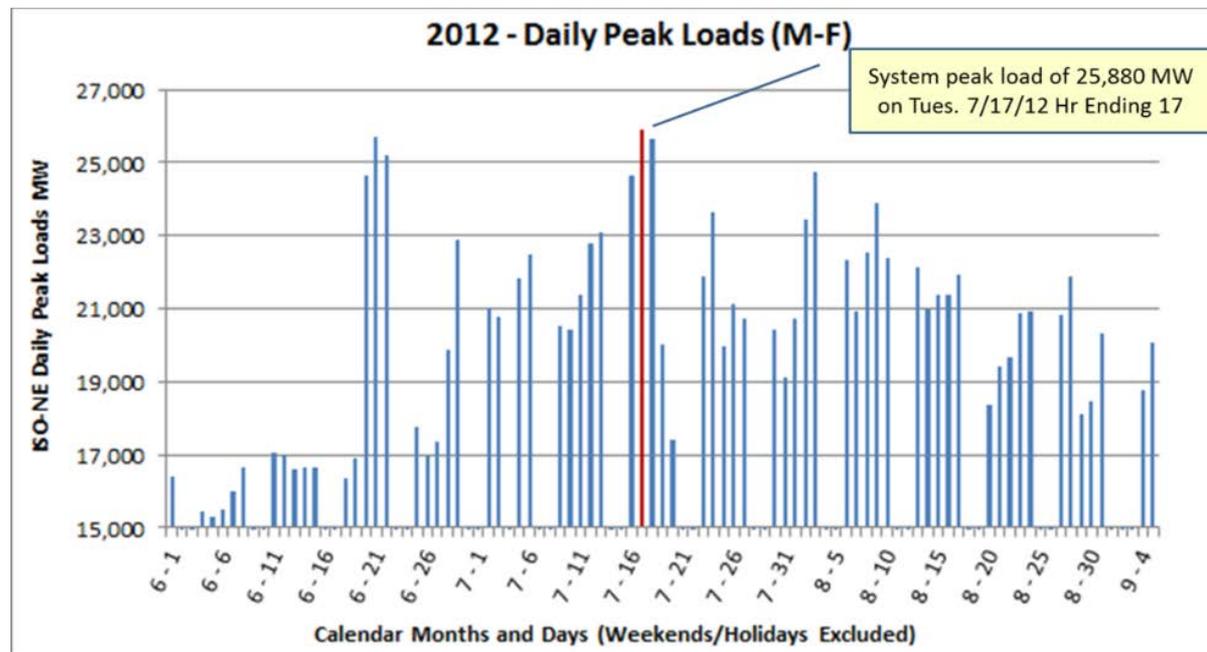
A Look Inside



Use Case: Peak Capacity Reduction



- **\$80-90 million/year** = GMP current obligation
 - \$30 - \$40 million/year = Capacity portion (one annual peak); will triple by 2018.
 - \$50 - \$60 million/year = Transmission portion (12 monthly peaks); will increase as transmission gets built in NE
- **GMP calculates it will soon be paying \$150 million/year to NE-ISO.**



Monetizing Storage



- ~\$1 million/MW/year = GMP site overall value
 - \$300,000 - \$500,000 /MW/year for peak capacity shaving
 - Frequency regulation
 - Solar RECs
 - Solar energy generation (kWh)
- Bottom line
 - GMP anticipates a **5-10 year payback**
- Additional values
 - Emergency shelter
 - Solar smoothing
 - Automatic voltage and frequency response



Thanks



Special thanks to

- Imre Gyuk, US DOE
- Dan Borneo, Sandia National Laboratory
- Josh Castonguay, Green Mountain Power
- Todd Olinsky-Paul, Clean Energy States Alliance





Chris Larsen
clarsen@Dynapower.com
919-601-8679