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Docket Number:	17-IEPR-13
Project Title:	Strategic Transmission Investment Plan
TN #:	217691
Document Title:	Utilizing Energy Storage as Non-Wires Alternatives
Description:	Presentation by Alex Morris with California Energy Storage Alliance
Filer:	Stephanie Bailey
Organization:	California Energy Storage Alliance
Submitter Role:	Public
Submission Date:	5/22/2017 2:30:29 PM
Docketed Date:	5/22/2017

Utilizing Energy Storage as Non-Wires Alternatives

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May 24, 2017



About CESA

The **California Energy Storage Alliance (CESA)** is a 501c(6) membership-based advocacy group committed to advancing the role of energy storage in the electric power sector through policy, education, outreach, and research. CESA was founded in January 2009 by Janice Lin and Don Liddell.

CESA's mission is to make energy storage a mainstream energy resource in helping to advance a more affordable, clean, efficient, and reliable electric power system in California.



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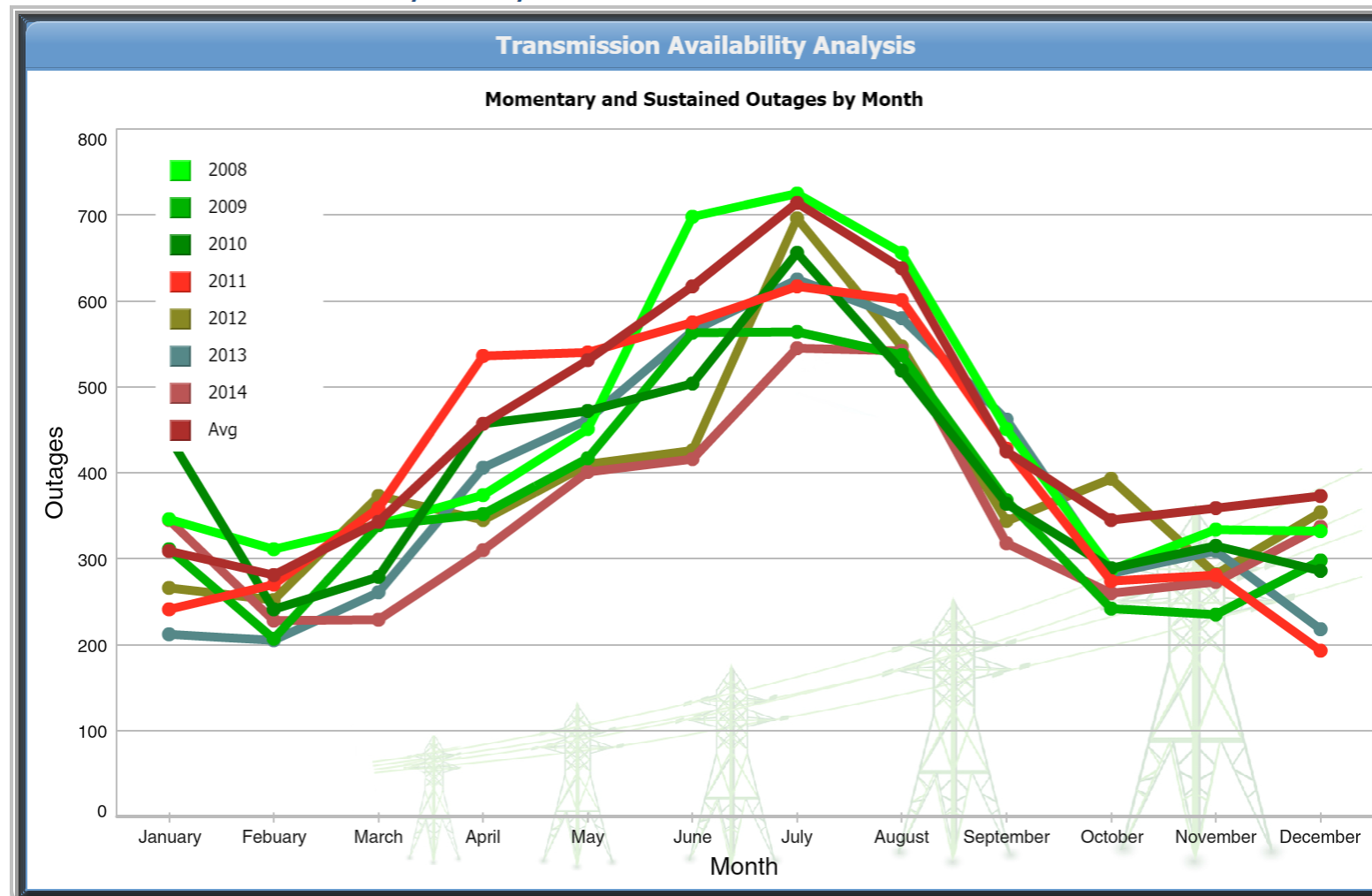
Key Benefits of Non-Wires Alternatives

- **Reduced environmental impact:**
 - May avoid infrastructure siting concerns faced by traditional wires solutions
 - Supports renewables integration through multiple-use applications
- **Quicker deployment:**
 - Designed and constructed relatively quickly compared to traditional wires solutions
- **Reduced financial risk through modular deployment:**
 - Developed incrementally as needs emerge or change
 - Improves transmission utilization while lowering energy/congestion costs (i.e., dilutes costs of the Transmission Access Charge) through multiple-use applications
- **Easier local siting and access:**
 - Provides reliability advantages by being sited closer to load

Example: Presidio, Texas

- **Presidio, TX was reliant on a single, aging transmission line**
- **ERCOT and Texas PUC approved a 4-MW, 32-MWh battery to support power quality on a transmission line feeding Presidio:**
 - Addressed voltage fluctuations affecting power quality
 - Allowed for maintenance on a new transmission line being built from Marfa to Presidio without loss of electric service
 - 8 hours of power during an outage
- **Key takeaways:**
 - Project took two years from commissioning to operations
 - TX PUC set a split-rate treatment
 - Transmission cost of service for reactive-power portion of battery
 - Separate wholesale transmission rate schedule for back-up service portion of battery

Transmission Wires Can Be Unavailable Too



Source: NERC. <http://www.nerc.com/pa/RAPA/tads/Pages/TransmissionAvailabilityAnalysis.aspx>

Thank You!

Questions?

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Appendix

Energy Storage = FACTS plus Real Power Services

- **FACTS = Flexible AC Transmission System**
- **FACTS are common for improving transmission power flows**
- **Energy Storage = FACTS with Real Power (because of 4 quadrant inverters)**
- **Energy Storage can provide the same FACTS service, constantly, without reducing real power capability (the state of charge)**
- **Short duration energy storage offers additional capability to FACTS when required:**
 - Frequency response, increased voltage stability, increased reliability (particularly momentary outages), additional flexibility for line maintenance and switching
 - Longer duration storage will offer additional applications

FACTS Resource: <https://library.e.abb.com/public/75362d2c1aa7f86783257e0c00478a6f/SVC%20A02-0100.pdf>

Energy Storage plus FACTS/STATCOM Paper: <https://www.hindawi.com/journals/ape/2012/676010/>

Energy Storage plus FACTS/STATCOM Case Study: <http://energystorage.org/energy-storage/case-studies/earning-revenue-multiple-value-streams-kaheawa-windfarm-dynamic-power>