

Puerto Rico Mutual Aid

Hurricane Maria

WITHOUT POWER SINCE
IRMA HELP!

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Powering forward. Together.

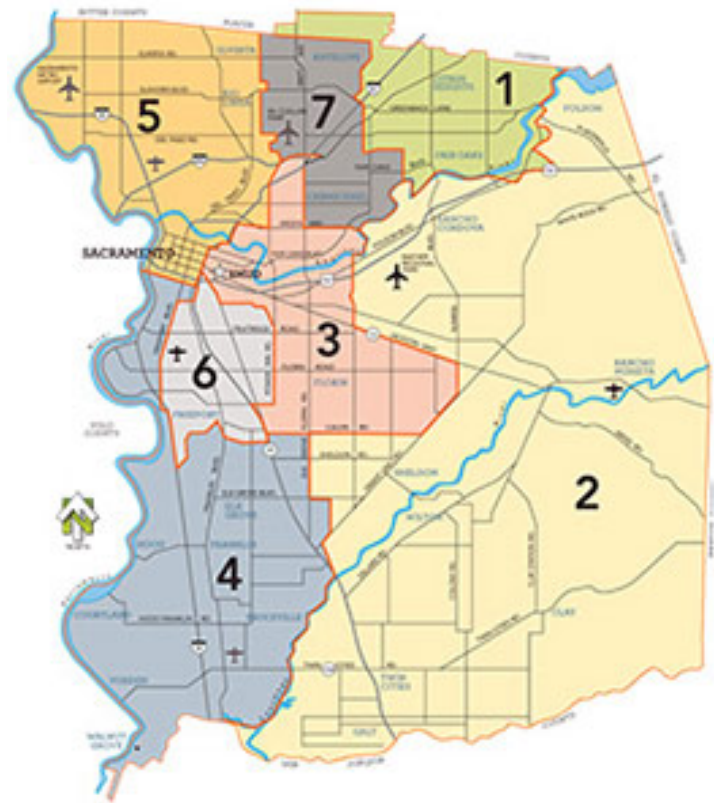


Presentation Topics

- About SMUD
- Hurricane Maria
- Electric Sector Mutual Aid
- Puerto Rico Deployment
- Lessons Learned

SMUD System Characteristics

- SMUD's Service area is 900 square miles
- Population served is 1.5 million
- 626,500 customers
- 2200 employees
- 477 miles of transmission
- 10,000 miles of distribution
- 2,200 MW of generation, comprised of:
 - Local Thermal (50%)
 - Hydroelectric (20%)
 - Purchased Renewable and Hydro (15%)
 - Other Purchased Power Resources (9%)
 - Solar and Wind (6%)

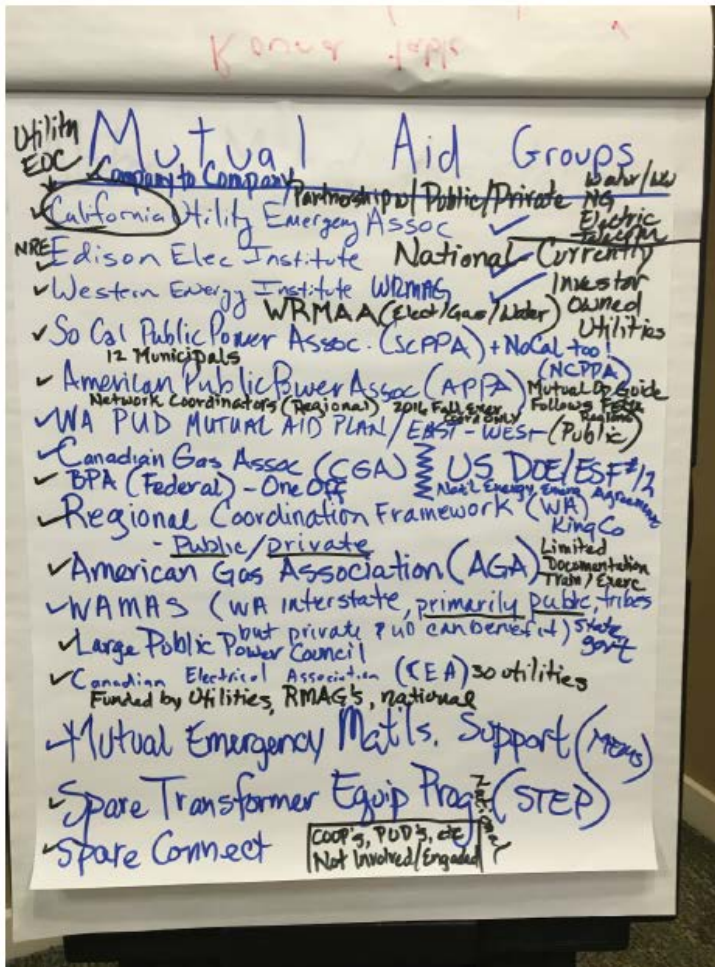


Hurricane Maria

- Landfall September 20, 2017 as a Category 4, 155 MPH winds, 38" of rainfall
- 64 official fatalities, number likely much higher
- 70,000 homes destroyed, >250,000 damaged
- >\$90B in damages
- 100% of the electric infrastructure damaged
- Approximately 10% of the 3.5M population has left the island
- 43.5% of the population lives below the poverty line
- Both Puerto Rican Territory and PREPA were in bankruptcy proceedings before the hurricane



Energy Sector Mutual Aid

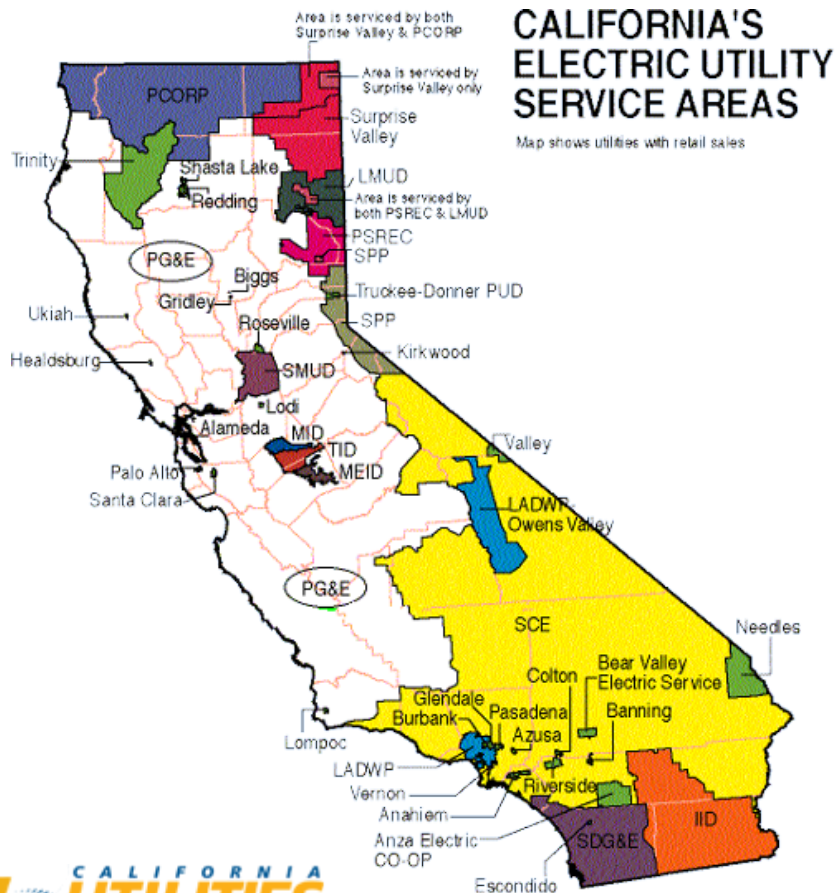


Mutual Aid

VS

Mutual Assistance

California Mutual Assistance



California Utilities Emergency Association Mutual Assistance Agreement

Western U.S. & Canada Mutual Assistance



Western Region Mutual Assistance Agreement

Hosted by the Western
Energy Institute

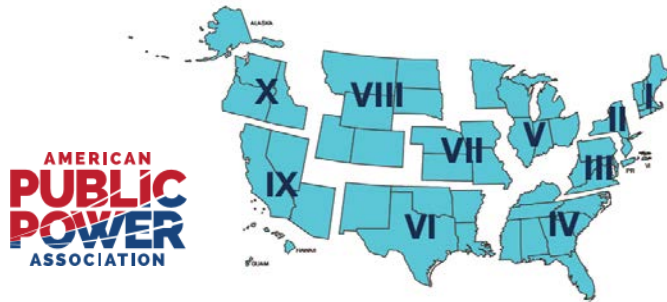
National Mutual Assistance

National Response Event (NRE)

Regional Mutual Assistance Groups



Mutual Aid Playbook (MAP)



ESCC
Electricity Subsector
Coordinating Council

*American Samoa, Commonwealth of Northern Mariana Islands, Republic of Marshall Islands, and Federated States of Micronesia are not shown.

ESF-12, Energy
Department of Energy

Industry Organizations



Hurricane Maria Response

- Hurricane Maria arrived September 20, 2017 two-weeks after Hurricane Irma
- Initial focus was life-safety
not power restoration
- No infrastructure to support mutual assistance



Hurricane Maria Response +7 days

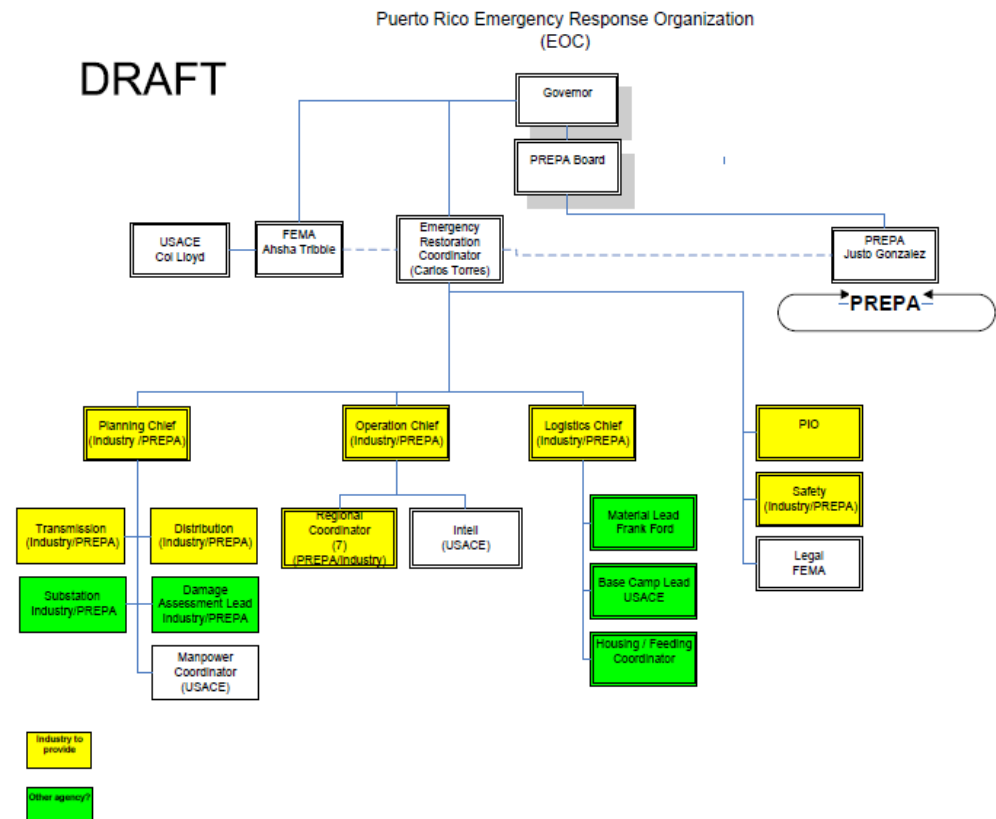
- September 28, 2017, FEMA announces 100% FEMA reimbursement for USVI and Puerto Rico
- USACE assigned as restoration Lead in Puerto Rico with \$335M
- PREPA contracts with Whitefish Energy to coordinate restoration with private contractors

Hurricane Maria Response +40 days

- October 31, 2017, Whitefish Energy contract cancelled. Only 33% of the island restored
- USACE takes over restoration in earnest
- PREPA makes first request for mutual assistance for up to 6 month, long term deployment
- Significant logistics, crew support, and reimbursement concerns

Hurricane Maria Response +69 days

- November 29, 2017, request to stand up industry Incident Management Teams
- EEI provides help
- Need MOU with PREPA



Hurricane Maria Response +80 days

- December 2017, EEI and APPA utilities begin mobilization, restoration at ~50%

Puerto Rico Incident Management Teams



Hurricane Maria Response +90 days

- ESSC led by EEI announces a 60 day push to get restoration over 90% in 60 days in Puerto Rico.
- December 18, 2017, SMUD commits to providing support: 2 heavy line construction crews, supervisor, mechanic, finance specialist, 16 personnel total
- SMUD signs new MOU with PREPA for 100% pass-through money from FEMA

Hurricane Maria Response +100 days

- December 30, 2017, SMUD ships 15 trucks and equipment via low boy trucks to Lake Charles, Louisiana to ship by barge with other utilities
- CUEA assists with waivers for transport
- SMUD signs a joint cost agreement with Arizona Public Service Company to share barge to PR



Hurricane Maria Response +119 days

- January 17, 2018 SMUD crews arrive in San Juan and begin restoration work in the Carolina Region
- SMUD secured rooms at the Hilton Condado, undergoing restoration
- Food, fuel and support for crews not an issue in San Juan
- Crews swapped out after 30 days working on the island
- Crews returned March 22, 2018

Lessons Learned

- Very difficult to provide assistance where the host utility is unprepared
- Cannot send resources into an area until the area can support
- Incoming crews must match work and material availability
- Different utilities do work differently
- Need to develop relationships and agreements before the disaster

Future Opportunities

- We need to better plan national/regional events
- Industry needs to better plan with federal agencies
- We need to expand IMT concept for support
- Need to develop a 'Task Force' concept for smaller utilities and cost share
- Common standards for crews, systems, and materials
- Better balance customer/public expectations, risk, disaster hardening and cost



Questions
