



**HAWAII
STATE
ENERGY
OFFICE**

Grid Resilience and Technology Solutions

NASEO Electricity Committee

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Transportation, and Analytics**

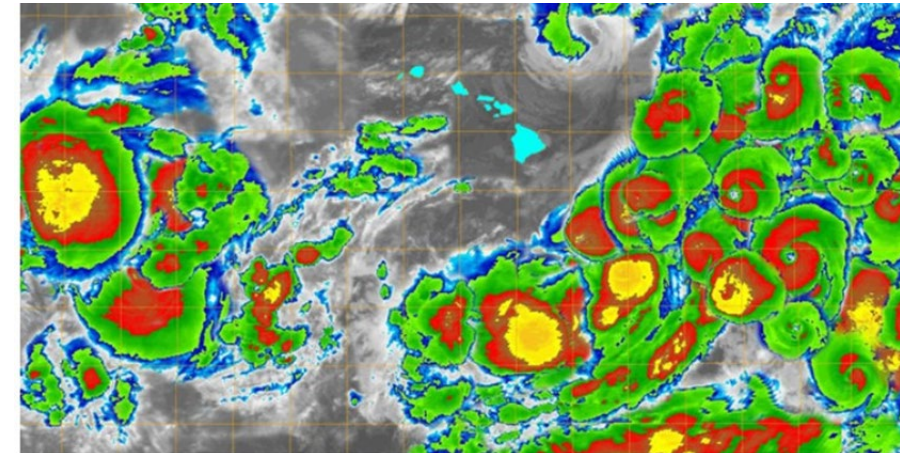
October 17, 2023

Who Response and Recovery



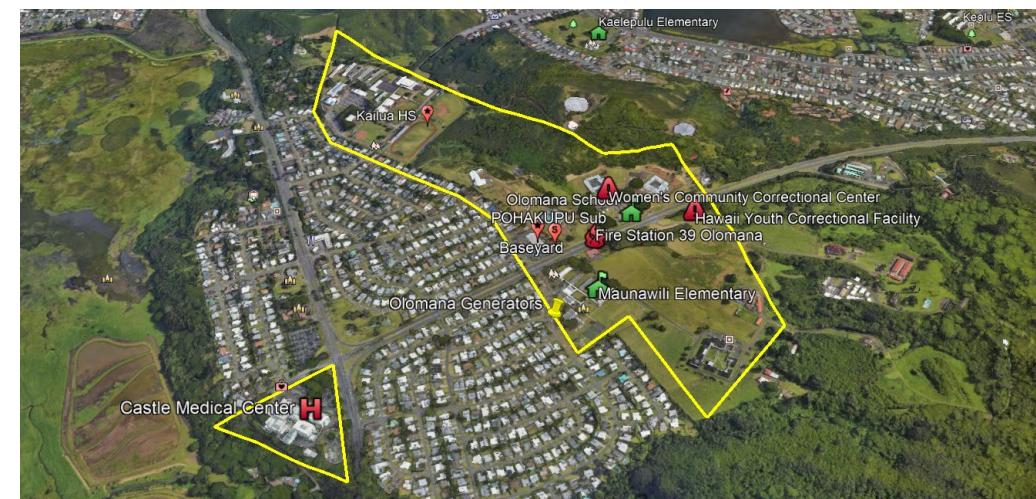
Lifelines are the most fundamental services in the community that, when stabilized, enable all other aspects of society to function.

 Safety & Security	 Food, Water, Shelter	 Health & Medical	 Energy (Power & Fuel)	 Communications	 Transportation	 Hazardous Material
 Law Enforcement/Security	 Food	 Medical Care	 Power (Grid)	 Infrastructure	 Highway/Roadway	 Facilities
 Fire Services	 Water	 Patient Movement	 Fuel	 Alerts, Warnings, & Messages	 Mass Transit	 HAZMAT, Pollutants, Contaminants
 Search & Rescue	 Shelter	 Public Health	 911 and Dispatch	 Railway		
 Government Services	 Agriculture	 Fatality Management	 Responder Communications	 Aviation		
 Community Safety	 Medical Supply Chain		 Finance	 Maritime		

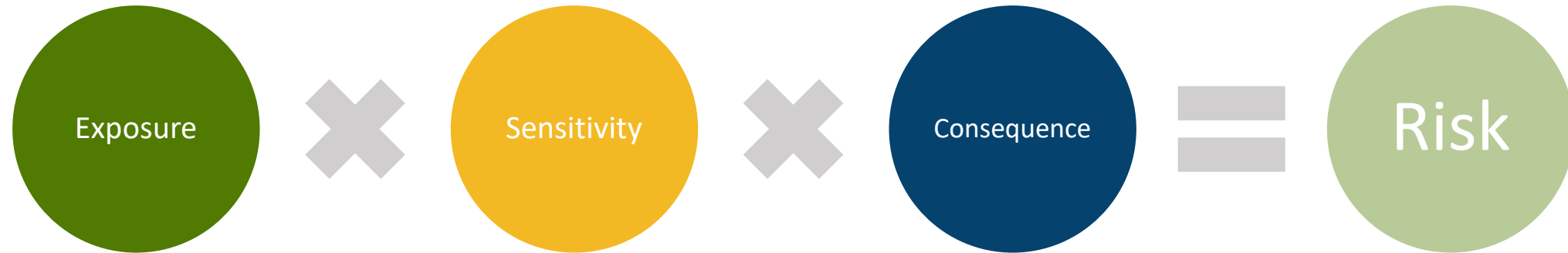


COURTESY KEVIN KODAMA/ CENTRAL PACIFIC HURRICANE CENTER

This graphic, created by the National Weather Service, consists of infrared satellite images for each of the 15 tropical cyclones in the 2015 hurricane season when the cyclone was active in the Central North Pacific basin



What Risk Assessment Methodology



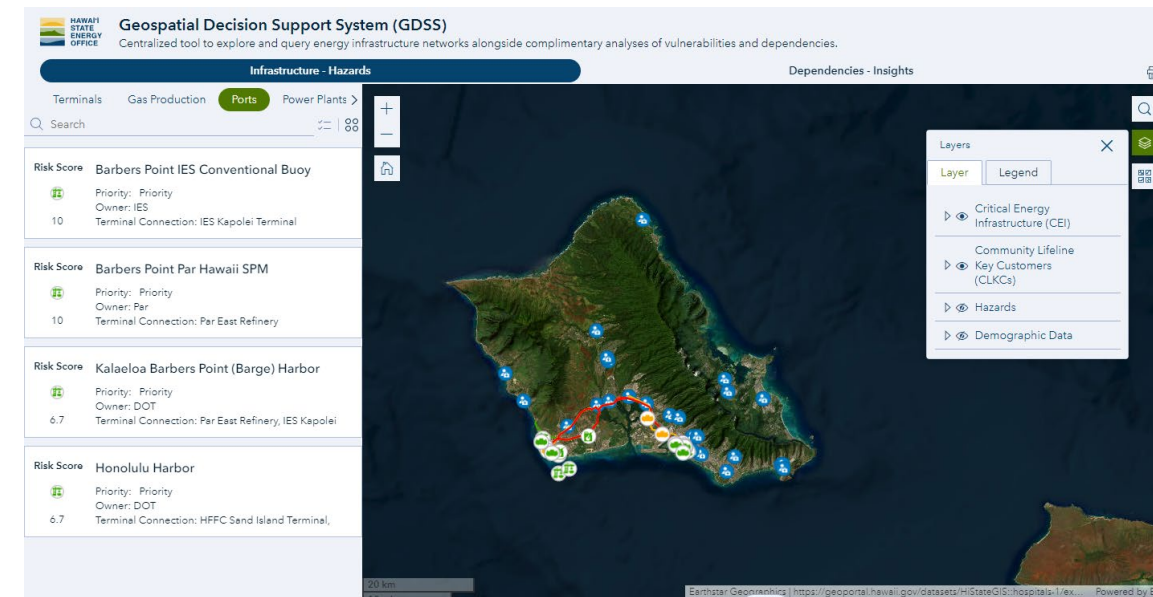
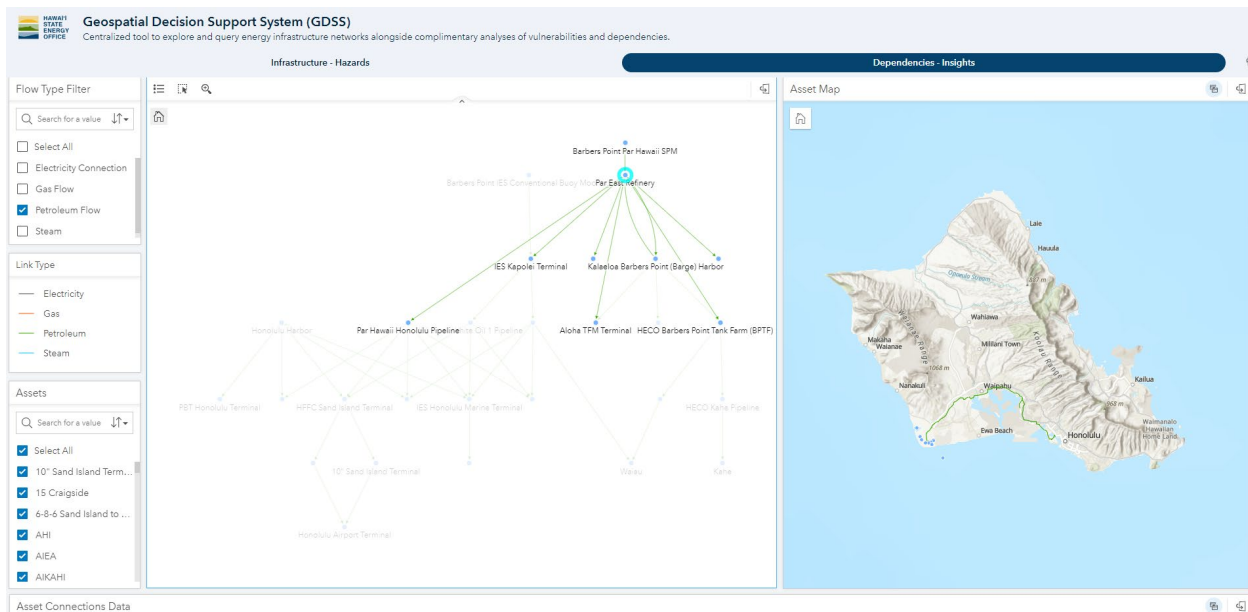
- Specific to location
- Probability of occurrence on an annual basis, assigned to buckets
- Informed by historic climate data (NOAA, NWS, etc.) in collaboration with the State Hazard Mitigation Plan and probabilistic models

- Specific to asset type
- Can be interpreted as the expected outage duration from exposure to a given threat, bucketed 1-3
- Informed by subject matter experts

- Specific to asset
- Primary consequence represented as lost energy supply from asset outage
- Secondary consequence represented by cost to society of lost supply—our focus with the CLKC dependency analysis
- Informed by analysis of asset and interdependency relation

How

Dynamically explore Critical Energy Infrastructure (CEI), Community Lifeline Key Customers (CLKC), and hazards



Response and Recovery

What are the interdependencies of community lifeline key customers (CLKC) on critical energy infrastructure

Resiliency Planning and Investment

Where is the critical energy infrastructure (CEI) and the community lifeline key customers and what are the risks they face based on their locations

Prioritize

A Relative Comparison of Project Alternatives



A risk comparison of CEI within the energy supply chain

A comparison of projects and the extent to which they address state energy goals

Asset Risk Overview

Instructions: Review automatically generated project details, and add notes on population served, SVI indices, historical losses, and additional risk and vulnerability details. User inputs needed are indicated in yellow.

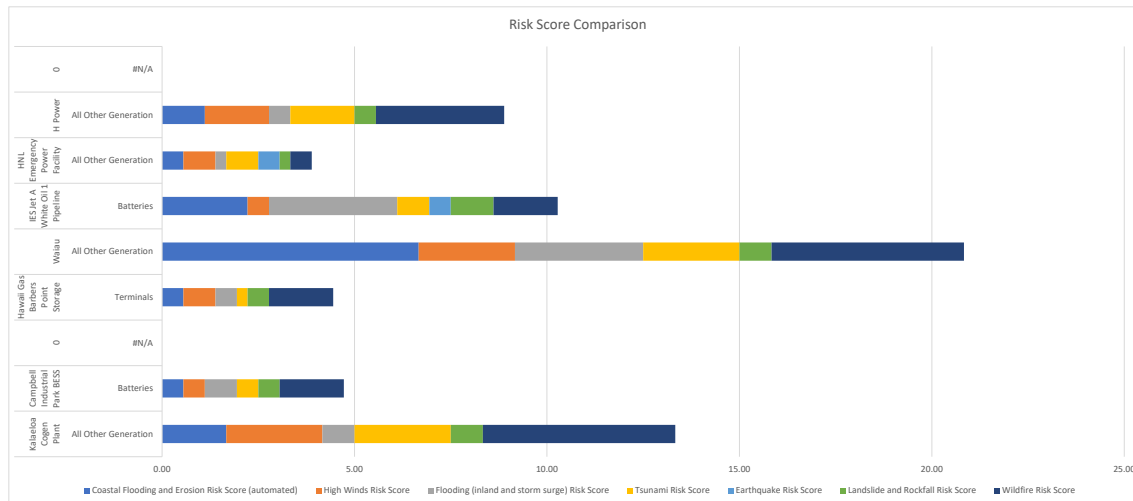
	Project 1			Project 2			Project 3		
	Asset 1	Asset 2	Asset 3	Asset 1	Asset 2	Asset 3	Asset 1	Asset 2	Asset 3
Asset Name (automated)	Kalaheoa Cogen Plant	Campbell Industrial Park BESS	#N/A	Hawaii Gas Barbers Point Storage Terminals	Waiau	IES Jet A White Oil 1 Pipeline	HNL Emergency Power Facility	H Power	0
Asset Category (automated)	All Other Generation	Batteries	#N/A	Terminals	All Other Generation	Batteries	All Other Generation	All Other Generation	#N/A
Asset Criticality Score (automated). The asset criticality score provides a ranking of the most critical assets to electrical operations. Data Source: 2023 O'ahu Energy Risk Assessment.	6	2	#N/A	2	6	2	2	4	#N/A
Population Served									
Critical Assets Served (automated)	n/a	n/a	#N/A	n/a	n/a	n/a	n/a	n/a	#N/A
SVI Index of the Service Area									
Value of the Service Provided (\$/person served/day, automated). Estimates of the direct economic impacts of losing the service provided by the identified asset. Based upon FEMA standard values for benefit-cost analysis calculations Data Sources: FEMA Standard Economic Value Methodology Report	n/a	n/a	#N/A	\$182.00	n/a	n/a	n/a	n/a	#N/A
Is the Asset Regulated?	0	0	#N/A	0	0	0	0	0	#N/A
Historical Losses - Has the asset experienced damage or disruption due to natural hazards? (Select response from the drop-down)									
If yes, describe the nature of the loss (Number of events, type of damage incurred, and duration of disruption)									
Additional Risk and Vulnerability Notes (Enter notes)									

Evaluation Criteria and Scoring

Instructions: Complete scoring, evaluation based on project details and risk data provided above. User inputs needed are indicated in yellow.

Goal Alignment	Evaluation Criteria	Project 1			Project 2			Project 3		
		Project 1	Project 2	Project 3	Project 1	Project 2	Project 3	Project 1	Project 2	Project 3
Goal 3	Population Served	Description: Does the project benefit a large service population?								
	Population Served Score:	3 - Low, less than 2,000 people benefiting	3 - Low, less than 2,000 people benefiting	3 - Low, less than 2,000 people benefiting						
Goal 3	Prioritize Benefits to Disadvantaged Communities	Description: To what extent does the proposed project protect communities with high Social Vulnerability Indices? Is a 40% goal being met?								
	DAC Score:	3 - Service Area has SVI score of less than 0.4	5 - Service Area has SVI score of 0.4 - 0.8	7 - Service Area has SVI score above 0.8						
Goal 3	Benefits to Critical Facilities	Description: Does the project benefit critical facilities, such as hospitals, fire, or police stations?								
	Critical Facility Score:	3 - Project serves community assets, but not critical facilities	5 - Project protects at least one critical facility	7 - Project protects multiple critical facilities						
Goal 1	Project Readiness	Description: Can the project be implemented?								
	Project Readiness Score:	7 - Project is designed and permitted, has full funds allocated, and maintenance entity is identified	3 - Project is in design, has partial funds allocated, and maintenance entity identified	5 - Project is designed and permitted, has partial funds allocated, and maintenance entity identified						
Goal 1	Risk Mitigation	Description: Does the project address the natural hazard risks most relevant for the asset?								
	Risk Mitigation Score:	5 - Project addresses more than 1 natural hazard risk identified	3 - Project addresses 1 natural hazard risk identified	5 - Project addresses more than 1 natural hazard risk identified						
Goal 3	Community Engagement	Description: Will the project be endorsed by the community, or is it likely to be rejected or cause burdens?								
	Community Engagement Score:	5 - Community endorsement obtained already through public engagement	0 - Not likely to be endorsed by the public or benefiting community	5 - Community endorsement obtained already through public engagement						
Goal 3	Cultural Impacts and Acceptance	Description: Will the project impact cultural sites? Have native communities been engaged and to what extent? Does the project align with cultural values?								
	Cultural Impacts and Acceptance Score:	5 - Native communities have been engaged, and project does not impact cultural sites.	3 - Native communities have been engaged, or project does not impact cultural sites.	0 - Native communities have not been engaged, and project negatively impacts cultural sites.						
Goal 2	Climate Change and Future Conditions	Description: Does the project incorporate climate change and future conditions in its design?								
	Climate Change Score:	5 - Project addresses climate change consequences expected in the next 100 years	0 - Project does not address climate change or future conditions	0 - Project does not address climate change or future conditions						
Goal 4	Innovative Solutions	Description: Does the project incorporate innovative approaches to project implementation?								
	Innovative Solutions Score:	5 - Project design implements innovative energy resilience solutions	0 - No innovative solutions proposed	5 - Project design implements innovative energy resilience solutions						
Goal 3	Workforce Development	Description: Does the project create new jobs or have workforce development partnerships?								
	Workforce Development Score:	3 - The project will create new jobs that will be maintained after construction	3 - The project will create new jobs that will be maintained after construction	5 - The project has workforce development partnerships and trainings planned						
Total Evaluation Score		44	25	42						

Risk Score Comparison



CLKC Microgrid

