

# Review of T&D NWA Opportunity Identification & Evaluation Process

Distribution Planning Working Group  
October 9, 2019



**Hawaiian Electric**  
**Maui Electric**  
**Hawai'i Electric Light**

# Scope of the DPWG

1. As stated in the IGP Workplan the scope of the DPWG as follows:
2. A review and exchange of information of the Companies' current state of the distribution planning process, and improvements and enhancements the Companies are making.
  - ◆ Describe the Companies' current process for capacity expansion of the distribution system, and improvements the Companies are making. Identify potential industry best practices to incorporate. This step will help address the County of Hawaii's comment which urges the expedited expansion of SLACA analysis to all islands to at least coincide with the first IGP planning cycle. [15]
  - ◆ Describe the Companies' current circuit hosting capacity methodology and improvements the Companies are making. Identify potential industry best practices to incorporate.
3. Identify sensitivities and scenarios for DER and load capacity planning analyses to appropriately identify distribution grid needs.
4. Identify non-wires alternatives opportunities and the related information requirements to effectively and efficiently procure and evaluate potential solutions.
5. Integration of distribution with resource and transmission planning.
  - ◆ Market-based issues (e.g., grid services definition, solution sourcing, economic solution evaluation methodologies) will not be part of the DPWG

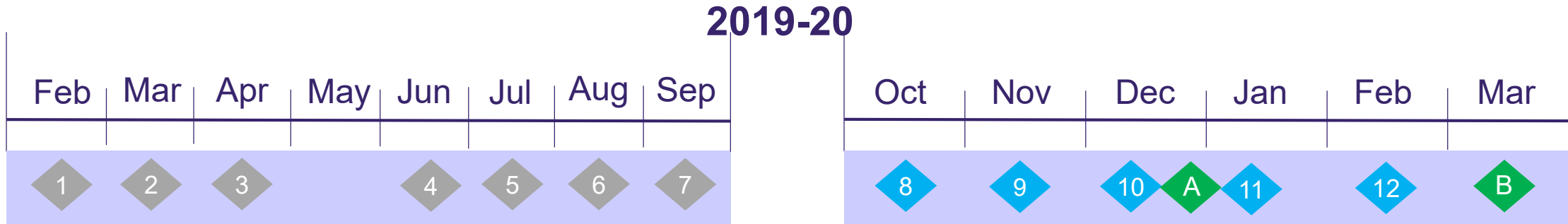


# DPWG Deliverables

- ◆ **Non-wires alternatives opportunities**
  - ◆ Document NWA Opportunity evaluation process, criteria and rationale
  - ◆ Document related NWA information requirements incorporating stakeholder feedback
- ◆ **Document Distribution Planning Methods** (incl. hosting capacity) any new changes based on stakeholder discussion and comparative assessment of industry best practices
- ◆ **Document Distribution level load and DER sensitivities and scenarios** to be used for distribution planning
- ◆ **Document methodology/process for integrating distribution with resource and transmission planning**



# Proposed Remaining Timeline for DPWG



1. Intro and overview of DPWG and Grid Services, and soft launch
2. Surveyed best practices across U.S. for NWA processes and methods for opportunity, identification, and procurements
3. Grid needs assessment methodology and process and candidate NWA opportunities for Soft Launch
  1. Defined new NWA services: Distribution Capacity and Reliability (back-tie) Service
  2. Presented East Kapolei and Ho’opili grid needs
4. High-level review of Soft Launch RFP
5. Develop ongoing NWA process for identifying and evaluating opportunities, sourcing approaches and evaluation methods. Incorporated best practices and stakeholder feedback
6. Detailed review of Soft Launch Opportunities – In depth review of Ho’opili
7. Draft Soft Launch RFP released – review of RFP w/ stakeholders

8. 2020 NWA Opportunities & Proposed Opportunity Evaluation Screen & Stakeholder information requirements (4 hrs)
9. Proposed distribution planning methodology enhancements for 2020 IGP (4hrs)
10. Distribution planning integration with Resource & Transmission planning process (4hrs)
11. Distribution planning load scenarios and sensitivities methodology (4hrs)
12. Proposed distribution planning load scenarios and sensitivity methodology (4hrs)
- A. 2020 NWA Opportunities & Opportunity Evaluation Screen Guidelines
- B. Final Documentation of Deliverables Posted to HECO Website *w/stakeholder outstanding comments noted*

Note: Meeting times include any carry over topics/open items from prior meeting

# Agenda

**Objective:** Obtain stakeholder feedback and discussion of proposed non-wire alternatives (NWA) Opportunity Evaluation Framework to be used in 2019 and the first IGP cycle to identify viable NWA opportunities.

- ◆ Soft Launch Update
- ◆ Stakeholder Feedback – NWA Framework Straw Proposal
- ◆ Case Study Exercise
- ◆ Stakeholder Discussion
- ◆ Next Steps



# SOFT LAUNCH UPDATE



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# Summary Comments Received

## ◆ Synergy Sections 1.2.3.3, 3.11

- ◆ Allow bidders to propose synergistic applications and associated contracting methods, and incorporating them into future procurements.

## ◆ Technical specifications Sections 2.4, Appendix J

### 1. General:

- a) Why during a contingency event do inverter-based resources trip and remain offline until voltage and frequency are restored and remain stable for five minutes?
- b) Clarify if the proposed utility infrastructure can be sized smaller or larger to satisfy the needs not met by the NWA. What degree of flexibility there is in substation transformer sizing?

### 2. Ho'opili site:

- a) The inputs and assumptions of the overload conditions need additional examination, analysis, and explanation.
- b) HECO should develop a multi-pronged approach. Soft launch RFP is one prong, but HECO's approach should also include programs working with Ho'opili's developer and stakeholders to design programs that will reduce load growth.

## ◆ Lack of an Independent Observer Sections 1.2.3.2, 1.6.4-1.6.6, 4.4

- ◆ Engage IO for Soft Launch RFP, if possible and align Soft Launch with RDG RFP process guidance to make bid scoring available and transparent at the end.



# Summary Commission Comments

## ◆ Site Control Section 4.3

- ◆ HECO should consider potential solutions to mitigate potential site control issues, including either providing HECO-owned land for free (or at a transparent, fixed cost), or providing a fixed assumption for land cost that all developers would use. At a minimum, as the HECO Companies develop future NWA RFPs, they should plan to investigate potential site control issues as early as feasible, and work cooperatively with potential developers to reduce costs associated with site control/land acquisition.

## ◆ RPS eligibility criteria. Section 1.1.3

- ◆ HECO should clarify whether the RPS eligibility criteria precludes (1) battery only solutions; (2) thermal storage; (3) fuel cells; or (4) combined heat and power.





# Summary Commission Comments

## ◆ Medium to longer term improvements Section 3.11. 4.4.2.2

- ◆ The default direction of NWA procurements should be to let resources be compensated for the full value they provide, (e.g., letting them be part of other programs once they are up and running, but prioritizing dispatch optimally) ensuring that there is no “double counting”.
- ◆ HECO should consider adding a score in the bid evaluation process for the various environmental attributes of the NWA. For example National Grid considers in its benefit-cost analysis framework for non-wires solutions, both quantitatively and qualitatively, net avoided CO<sub>2</sub>, SO<sub>2</sub>, and NO<sub>x</sub>, avoided water and land impacts.

## ◆ Other

- ◆ **Section 1.2.4.1:** HECO should clarify the system integration data exchange requirements for behind the meter systems and discuss these requirements with developers to determine if they are prohibitive.
- ◆ **Section 2.1:** HECO should make clear why they chose a 5-year contract term. HECO should consider and explain if longer term would promote more/better bids. HECO should also consider if some sort of preferential renewal option would help promote better bids.
- ◆ **Section 2.1 Table 3:** HECO should clarify what the days in the table represent. If the maximum number of times the service can be called in the year is daily, the table should specify 365 days for all needs.
- ◆ **Section 2.2:** HECO should discuss with developers whether the ramp rate and time requirements would be prohibitive.
- ◆ **Section 4.7:** It looks as if HECO could use the disqualification, removal, or withdrawal of a single proposal to rescind the entire RFP. HECO should clarify that this is not the case, or otherwise limit its applicability.



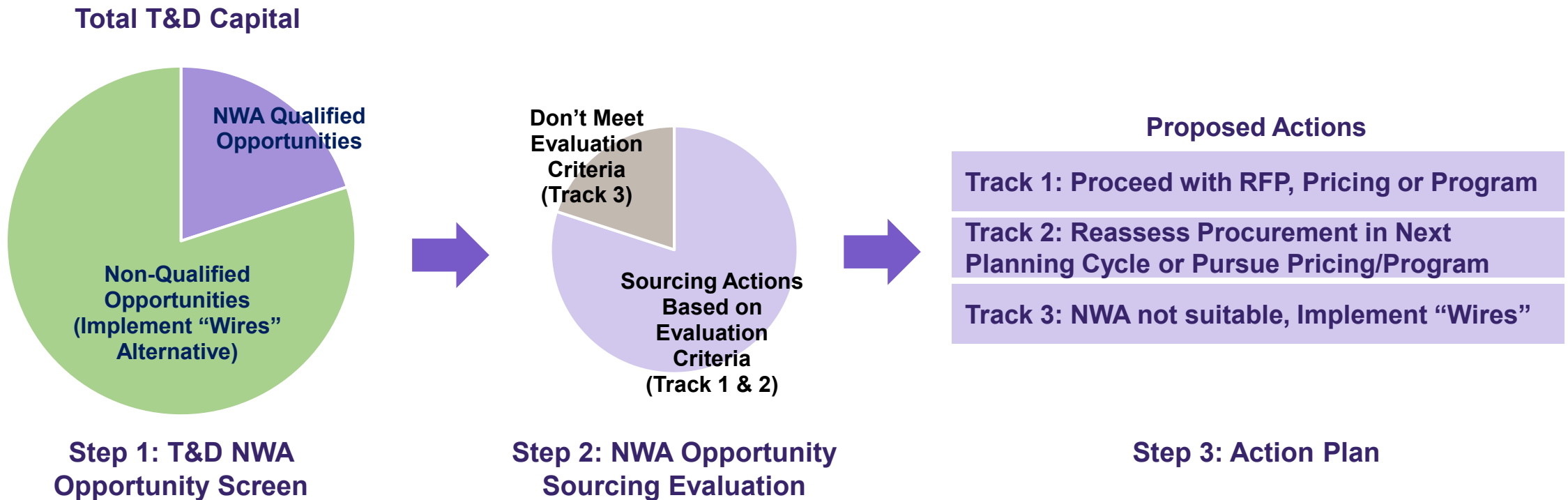
# NWA OPPORTUNITY EVALUATION FRAMEWORK



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# Refresher: T&D Project Qualification & NWA Opportunity Assessment

T&D opportunities are filtered through process to identify appropriate sourcing approach or determine “wires” alternative is best course of action



# Step 1: NWA Opportunity Screen

- ◆ Grid upgrades and T&D capital projects are assessed for potential NWA opportunity
- ◆ Initial assessment involves screening for whether a reduction in loading of the equipment/infrastructure or voltage/reactive power management (provided by T&D NWA services) would alleviate grid need/capital project.
- ◆ System expansion (e.g., load growth, hosting capacity increases, etc.), certain reliability (e.g., mitigating contingent overloads) and voltage/power quality needs may be met by NWA
- ◆ For others, an assessment of whether NWA services can functionally satisfy the basic requirement.
  - ◆ Aging substation circuit breaker replacement
  - ◆ Emergency transformer/conductor replacement
  - ◆ County public works request for ¼ mile of utility pole relocation
  - ◆ New customer service connection/new generator interconnection (NWA may reduce size of the need, but not the physical interconnection requested)



# Hawaiian Electric T&D Capital Budget

## Public Works Relocations, New Service Connections & Other

- ◆ Projects related to local (or other) government requirements. (i.e., line relocations), Minor OH & UG additions, new service connections

## Grid Modernization

- ◆ Telecom infrastructure, fiber optic, advanced metering infrastructure, FCI, protective relay upgrades, circuit monitoring program

## System Expansion

- ◆ Auiki (DOT Harbors), Kaaahi (HART), Waipio (Koa Ridge)

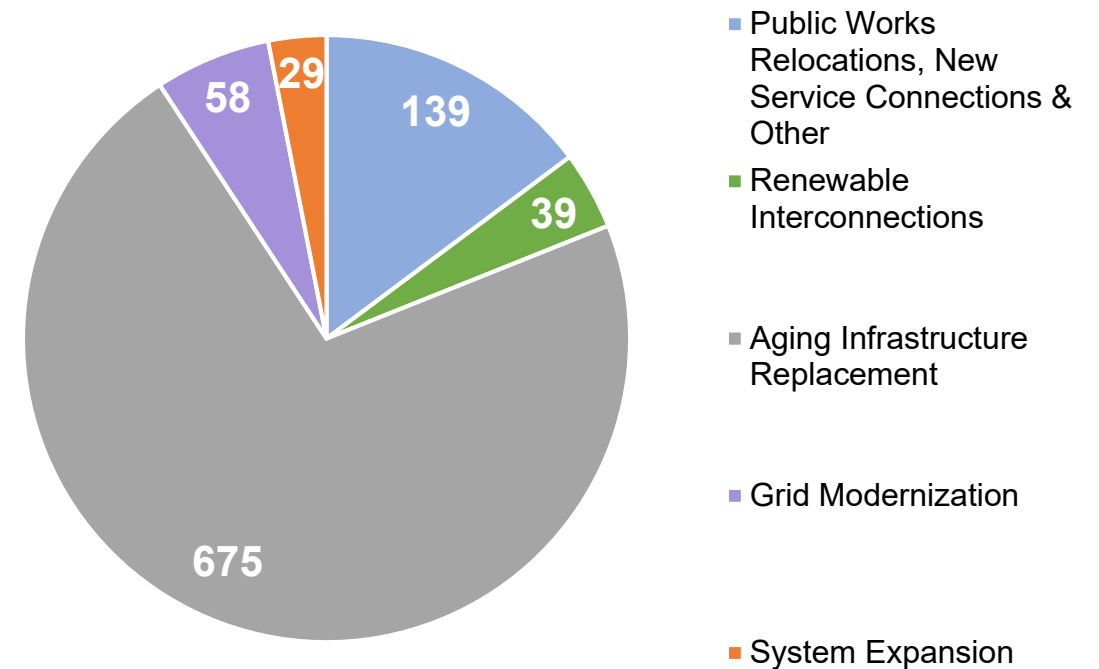
## Aging Infrastructure (Asset Management)

- ◆ Replacement of old transmission structures, distribution poles, and substation transformers, spare transformer inventory, downtown network replacement program, switch replacement program, corrective and emergency replacement of OH and UG cables, preventative repair or replacement of cables and transformer service connections

## Renewable interconnections

- ◆ Transmission and distribution interconnections of renewable projects

T&D Projects Greater than \$1M  
(\$ in millions)



Projects forecasted to spend >\$1M in 2019. (As of December 21, 2018)

# Hawaiian Electric T&D Capital Budget

- ◆ NWA opportunities largely reside in System Expansion (i.e., load growth, EoT, etc.)
- ◆ Unique opportunities may also exist in Asset Replacement
- ◆ Opportunities for resilience will be identified through further definition of planning criteria by Resilience WG and Microgrid Services Tariff docket
- ◆ Additional NWA opportunities will be explored through experience and industry learnings

# Refresher: Step 2: T&D NWA Opportunity Evaluation

- ◆ Intended to evaluate candidate T&D projects as viable NWA opportunities and prioritize resulting NWA opportunities.
- ◆ Evaluation Criteria:
  - ◆ **Performance** in relation to engineering/operational performance requirements
  - ◆ **Timing** of when needed in relation to sourcing duration and any related approval process time
  - ◆ **Forecast certainty** regarding the timing and scope of the grid “need”. (e.g., how certain is the increased load from a new commercial development – has a service request been submitted?)
  - ◆ **Market assessment** is based on assessing the potential for successful NWA solution development.
  - ◆ **Project Economics** will be based on the size of the deferral value of a qualified T&D capital project and any other relevant avoided costs.



# Refresher: Proposed T&D NWA Opportunity Sourcing

*NWA Opportunity sourcing assessment assigns projects into 3 action plan tracks based on the evaluation criteria*

- ◆ **Track 1: Procurement** Large, certain opportunities with high likelihood of NWA success for procurement (i.e., green on performance, timing, forecast certainty and either green or yellow on market and economics)
- ◆ **Track 2: Reassess Procurement or Pursue Program** Opportunities that can address performance and timing, but have factors that indicate reevaluating in the future for potential procurement if due to forecast uncertainty or pursue pricing and programs. (i.e., green on performance & timing and minimally yellow on other criteria)
- ◆ **Track 3: Not Qualified** Opportunities that have criteria (e.g., performance, timing, economics) that cannot be reasonably met by NWA solutions and so “wires” solution will be implemented.

Track	Grid Need	Performance Requirements	Timing	Forecast Certainty	Market Assessment	Economic Assessment
1	Project A	5hr Peak Load Reduction	Jan 2023-Dec 2027	High	High	\$600k/yr Avoided Cost
2	Project B	4hr Peak Load Reduction	Jan 2024-Dec 2028	Medium	Medium	\$250k/yr Avoided Cost
3	Project C	24x7 Load Reduction	Jan 2023-Dec 2027	High	Low	\$25k/yr Avoided Cost





# Stakeholder Discussion & Feedback

## ◆ Step 1: NWA Opportunity Assessment

### ◆ Refresher: Two options employed in other states to-date & proposed:

- ◆ Option 1: Define specific capital expense categories that are excluded (e.g., CA, ME, MI, NH, NY, and RI)
- ◆ Option 2 - HECO Proposal:
  - ◆ Explicitly evaluate all system expansion (incl. hosting capacity increases) and voltage/power quality
  - ◆ Conduct quick assessment of specific defined categories that generally don't suit NWA and identify potential exceptions (e.g., large customer line extension that may be addressed by microgrid)
  - ◆ Exclude a few specific categories (e.g., emergency repairs, public works relocations, aging infrastructure equipment, safety compliance, etc.)

◆ *What are the pros and cons of each method?*

◆ *Other ideas on how to filter to a list of NWA opportunities that can be satisfied by NWAs?*



# Stakeholder Discussion & Feedback

## Step 2: NWA Opportunity Sourcing Evaluation

- ◆ Three options based on other states to-date & proposed:
  - ◆ Option 1: Define specific capital expense and timing thresholds (e.g., ME, MI, NH, NY, RI & proposed by National Environmental Law Center in OH)
  - ◆ Option 2 - CA: employ a prioritization & filter
    - ◆ Performance Requirements
    - ◆ Timing
    - ◆ Forecast Certainty
    - ◆ Market Assessment
    - ◆ Economic Assessment (Project Size)
  - ◆ Option 3 - HECO Proposal: Adapt California's approach but also consider Programs and Pricing options for those NWA opportunities that don't fit Procurement

- ◆ *What are the Pros & Cons of each of the 3 approaches?*
- ◆ *Any enhancements for the Hawaiian Electric proposal?*
- ◆ *Any alternative approaches?*



# CASE STUDY EXERCISE

Upcoming Opportunities



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Hawai'i Electric Light

# Application of Proposed NWA Opportunity Evaluation Framework

- ◆ This exercise is intended to facilitate discussion and feedback on the proposed framework
- ◆ These examples are real potential opportunities for NWA sourcing in 2020+
- ◆ Stakeholders are encouraged to review this material ahead of the DPWG so as to enable a robust discussion on the application of the framework and the overall 3-step process
- ◆ HECO intends to finalize the framework based on stakeholder feedback and begin employing in Q4 to evaluate T&D capital projects for NWA opportunities



# PROJECTED OVERLOADS DUE TO NEW CUSTOMER LOADS

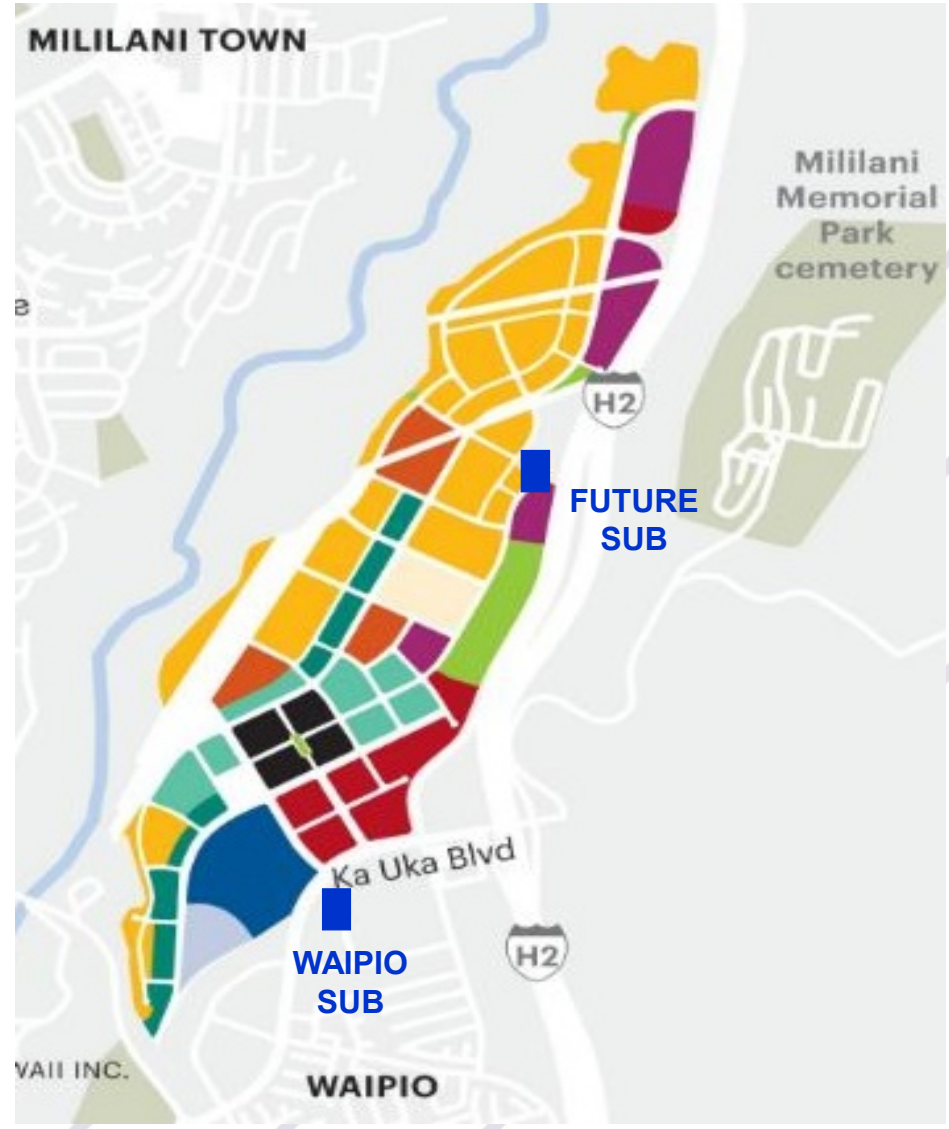


# Koa Ridge Development Location



# Koa Ridge Development

- ◆ **Koa Ridge Development** in Central Oahu near Mililani to be built by Castle & Cooke Hawaii includes 3,500 new homes, medical center, commercial & light industrial, parks & schools
- ◆ Estimated ultimate load: 43 MW (per developer)
- ◆ Initial load: 450 kVA (residential) in 2020
- ◆ Need Distribution Capacity by 2022/2023
- ◆ Transformer Load: See load profile for Waipio #1 Transformer



# Projected load growth due to Koa Ridge

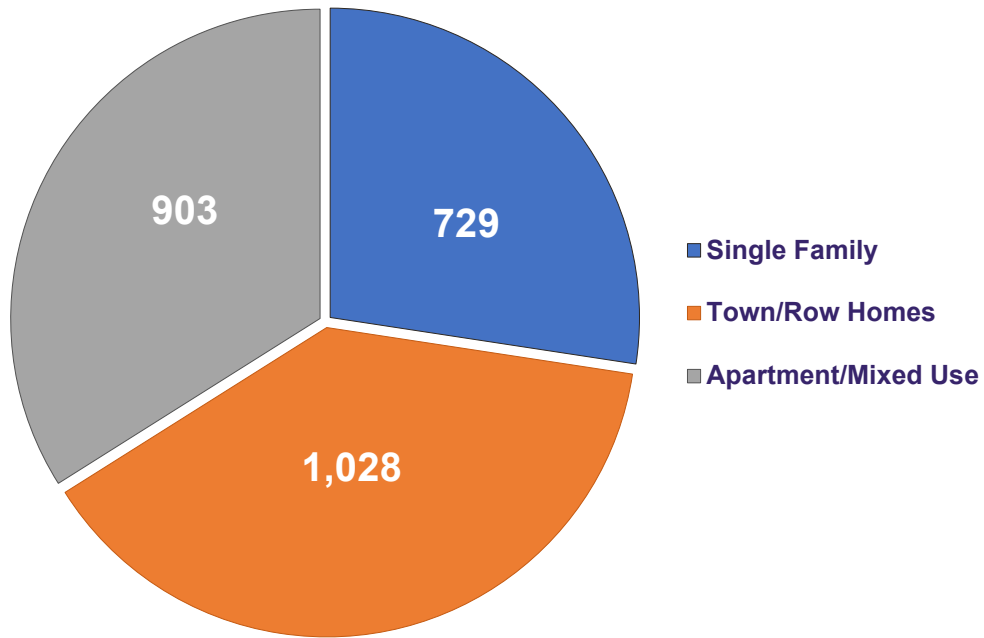
## Waipio Ckts Load Growth and Transformer Ratings



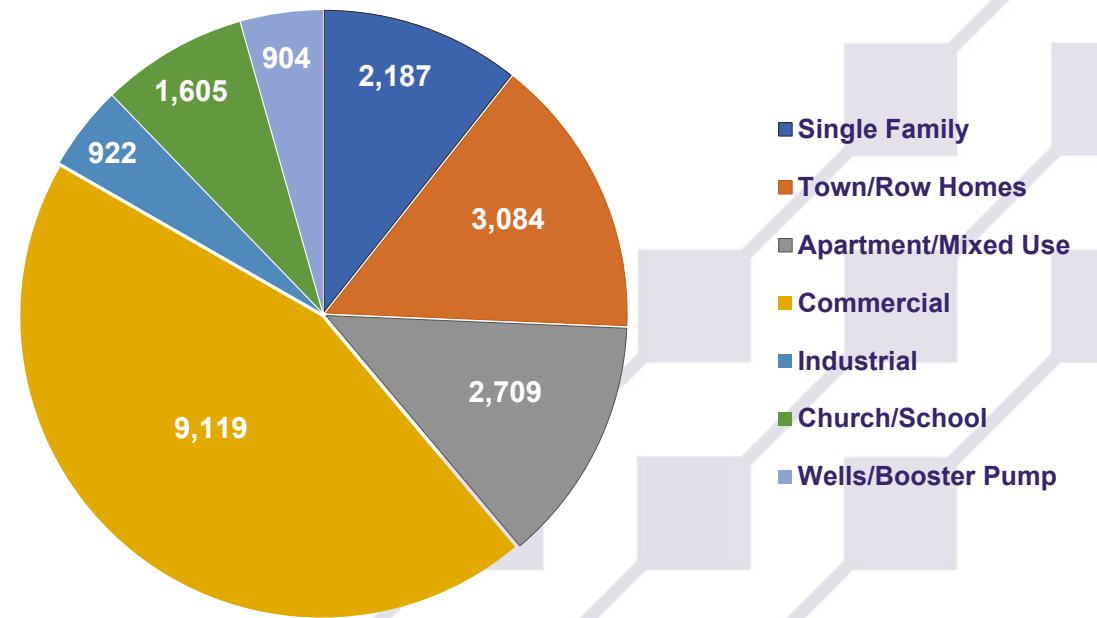


# Koa Ridge Customer Composition

## 2020-2026 New Residential Units



## 2020-2026 Projected Load by Type (kVA)



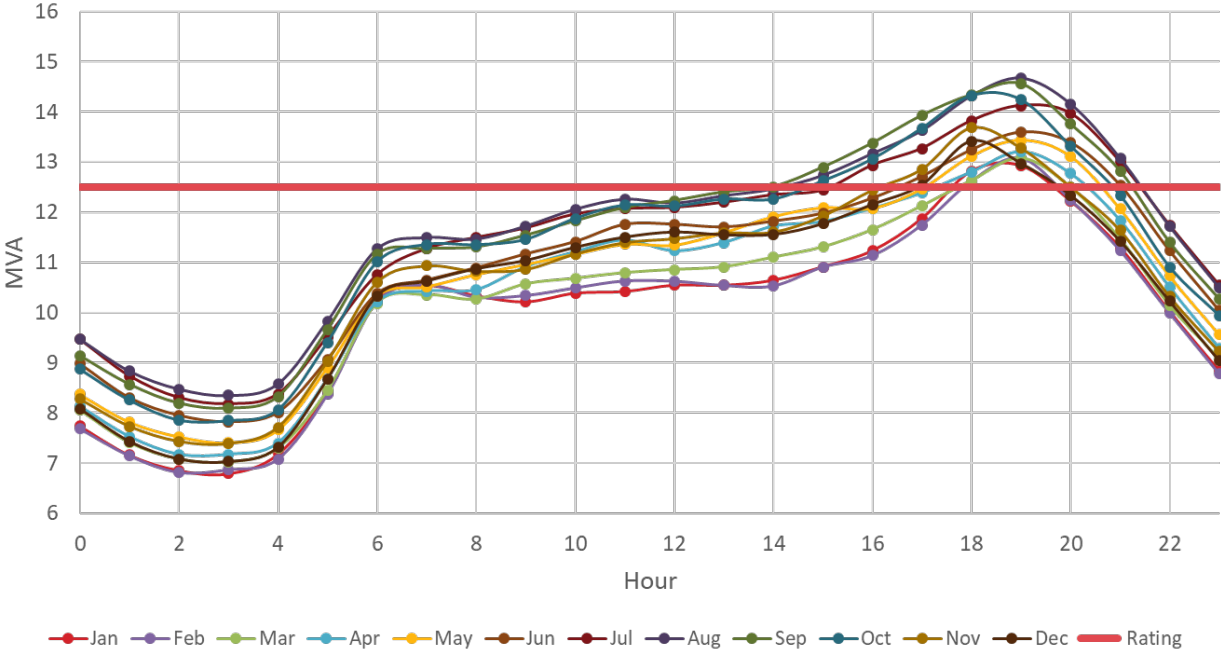
# Koa Ridge Area Review

Scenario #	Scenario Condition	Studied Equipment	Overloading	Overloading Period
1	Normal Condition	Waipio 1 Tsf, Waipio 1 Ckt, Waipio 2 Ckt	Yes	Waipio 1 Tsf, from 2022; Waipio 1 Ckt and 2 Ckt from 2024
2	Normal Condition	Waiawa 1 Tsf, Waiawa 1 Ckt, Waiawa 2 Ckt	No	
3	Normal Condition	Waiawa 2 Tsf, Waiawa 3 Ckt, Waiawa 4 Ckt	No	
4	Contingency Condition – Loss of Waipio 1 Tsf	Waiawa 1 Ckt, Waiawa 1 Tsf, Waiawa 4 Ckt, Waiawa 2 Tsf, Leomele Ckt, Waimano 2 Tsf	Yes	Waiawa 4 Ckt, from 2022; Waiawa 2 Tsf, from 2022
5	Contingency Condition – Loss of Waiawa 1 Tsf	Waipio 1 Ckt, Waipio 1 Tsf	Yes	Waipio 1 Ckt, from 2024; Waipio 1 Tsf, from 2022
6	Contingency Condition – Loss of Waiawa 2 Tsf	Waipio 1 Ckt, Waipio 1 Tsf	Yes	Waipio 1 Ckt, from 2024; Waipio 1 Tsf, from 2022
7	Contingency Condition – Loss of Waipio 1 Ckt	Waipio 2 Ckt	Yes	From 2022
8	Contingency Condition – Loss of Waipio 2 Ckt	Waipio 1 Ckt	Yes	From 2022

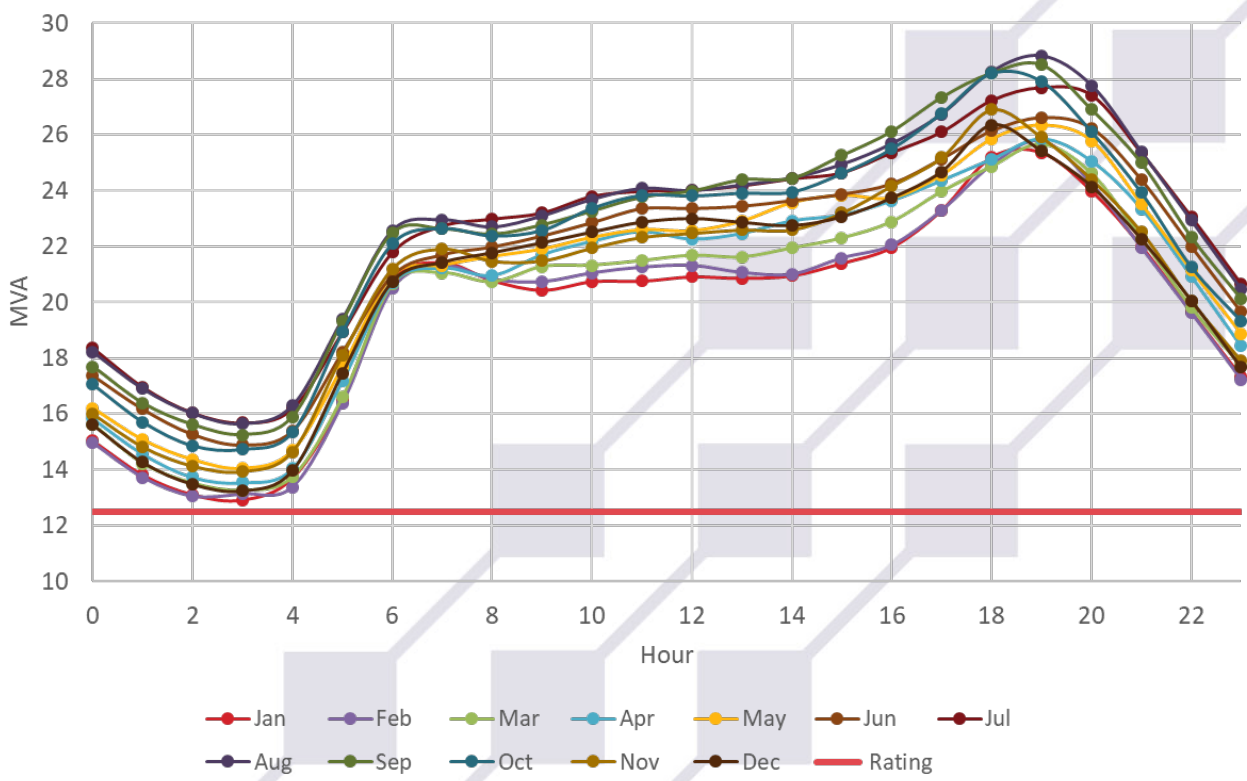


# Circuit Overloads 2022-2026

Waipio 1 Tsf Loading and Rating, in 2022, Normal Condition

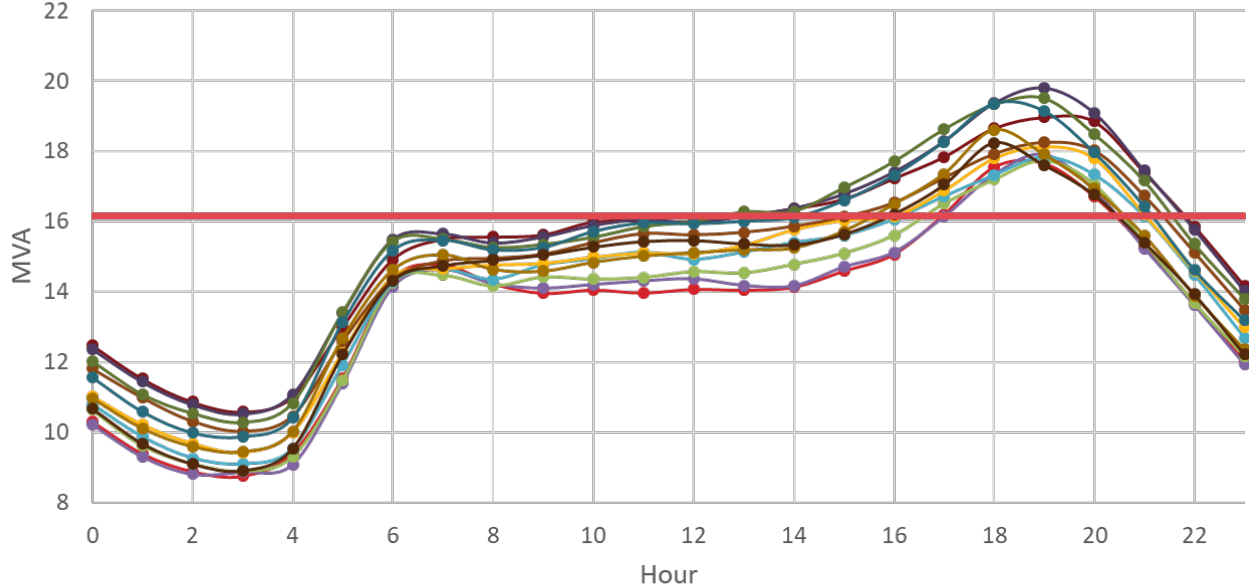


Waipio 1 Tsf Loading and Rating, in 2026, Normal Condition



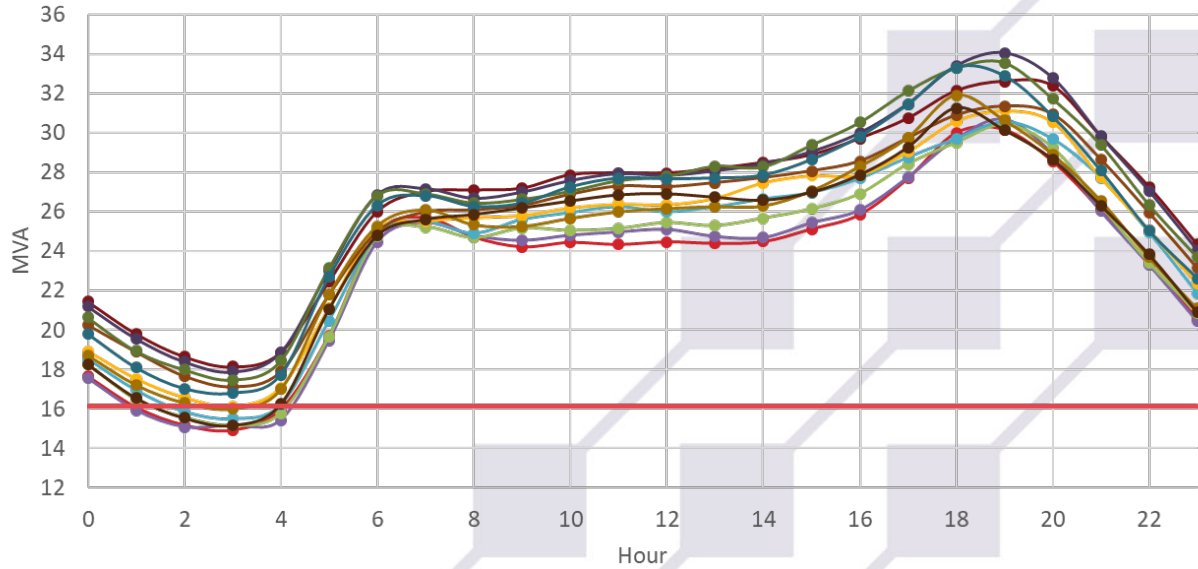
# Circuit Overloads 2022-2026

Waiawa 2 Tsf Loading and Rating, Loss of Waipio 1 Tsf, in 2022, Emergency Condition



- Jan
- Feb
- Mar
- Apr
- May
- Jun
- Jul
- Aug
- Sep
- Oct
- Nov
- Dec
- Rating

Waiawa 2 Tsf Loading and Rating, Loss of Waipio 1 Tsf, in 2026, Emergency Condition

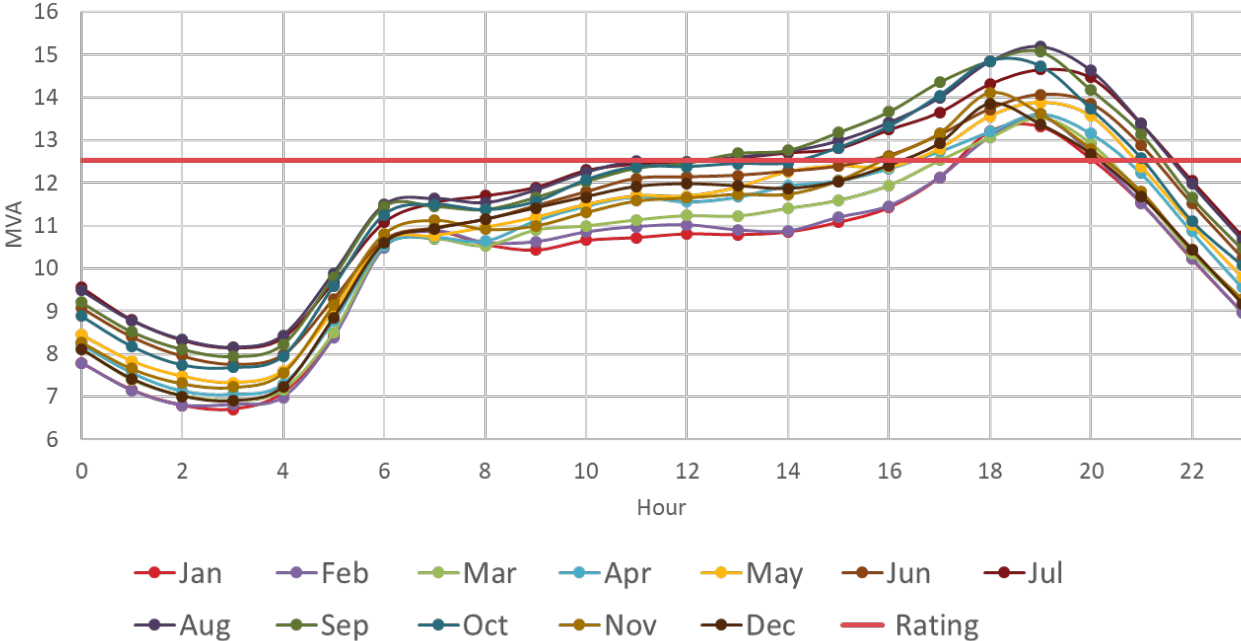


- Jan
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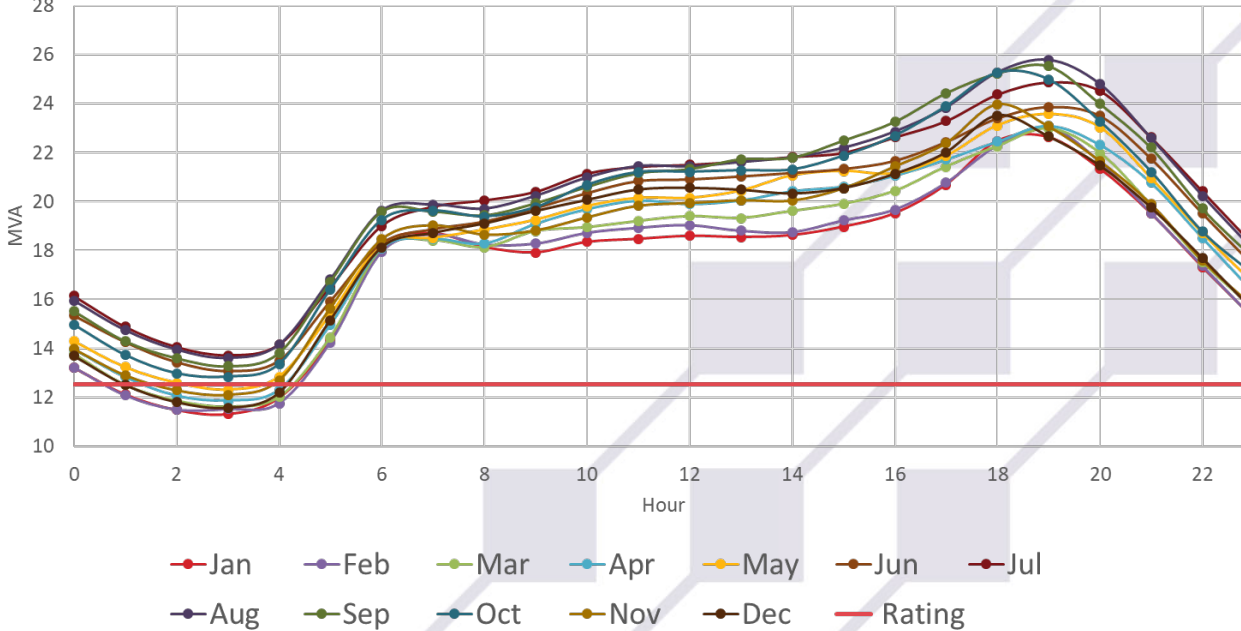


# Circuit Overloads 2022-2026

Waipio 2 Ckt Loading and Rating, Loss of Waipio 1 Ckt, in 2023, Emergency Condition

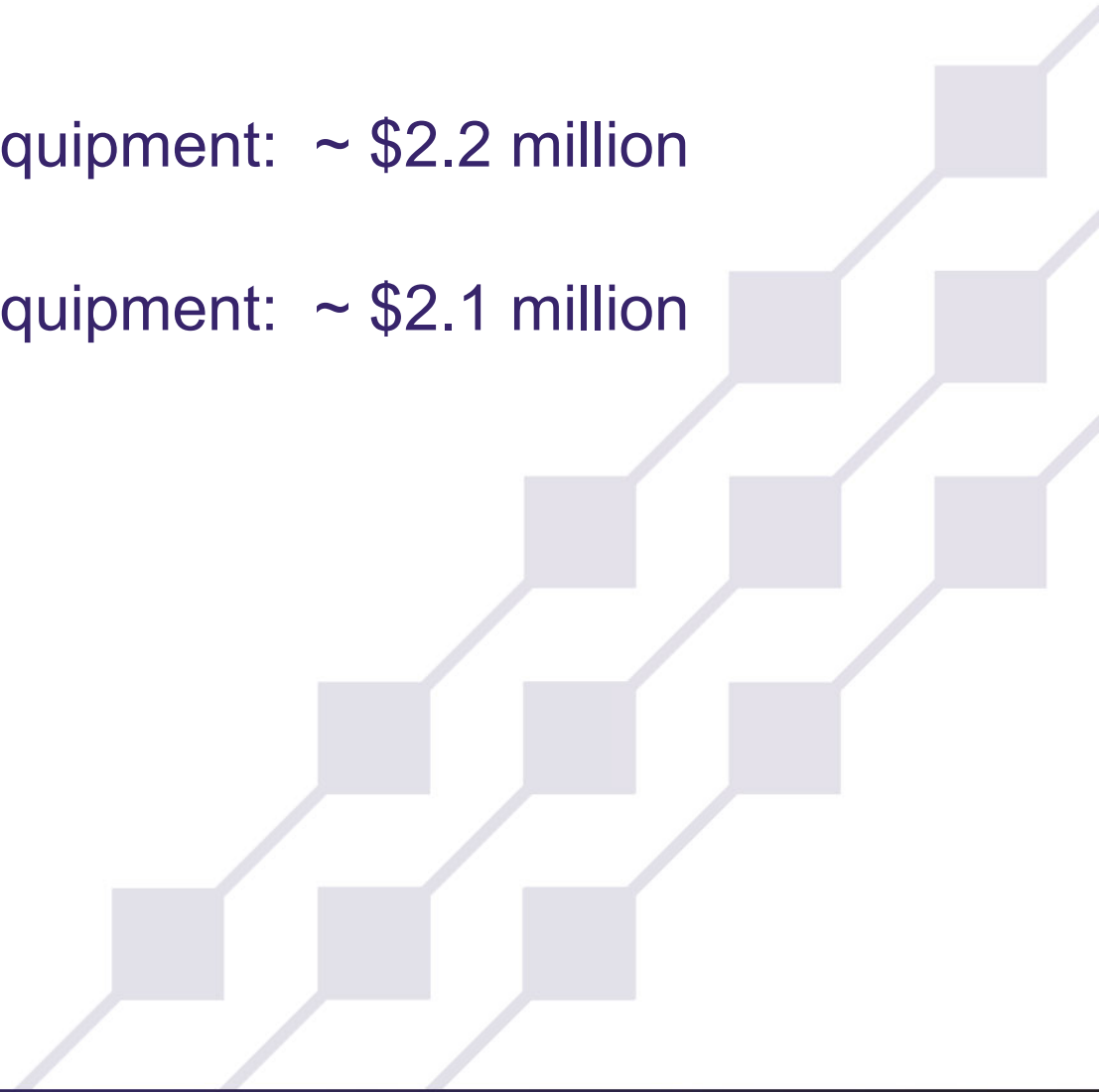


Waipio 2 Ckt Loading and Rating, Loss of Waipio 1 Ckt, in 2026, Emergency Condition



# Cost and Scope of Koa Ridge Wires Solution

- ◆ Installation of Waipio Tsf #2 and associated equipment: ~ \$2.2 million (projected in 2022)
- ◆ Installation of Waipio Tsf #3 and associated equipment: ~ \$2.1 million (projected in 2025)



# NWA Prioritization: Koa Ridge Development

- ◆ Qualified or non-qualified NWA opportunity?
- ◆ If qualified, how should this opportunity be prioritized based on the proposed metrics?
  - ◆ What technologies are available to meet the identified need?

Track	Grid Need	Performance Requirements	Timing	Forecast Certainty	Market Assessment	Economic Assessment
	Project A					



# Ala Moana Area Transit Oriented Development (TOD)

- ◆ The large services between Kalakaua and Ward Avenue along the Kapiolani Boulevard corridor are served by a 25 kV distribution system
- ◆ The source of the system is the Kamoku Substation (near Iolani School) and Kewalo Substation (in Kakaako)
- ◆ New residential/commercial projects have been proposed in the area due to the TOD Special District Design Guidelines which promote “intense and efficient use of land” near the rail stations
- ◆ HECO has already received six TOD related service requests and two more appear to be in development per news reports and feedback from City personnel

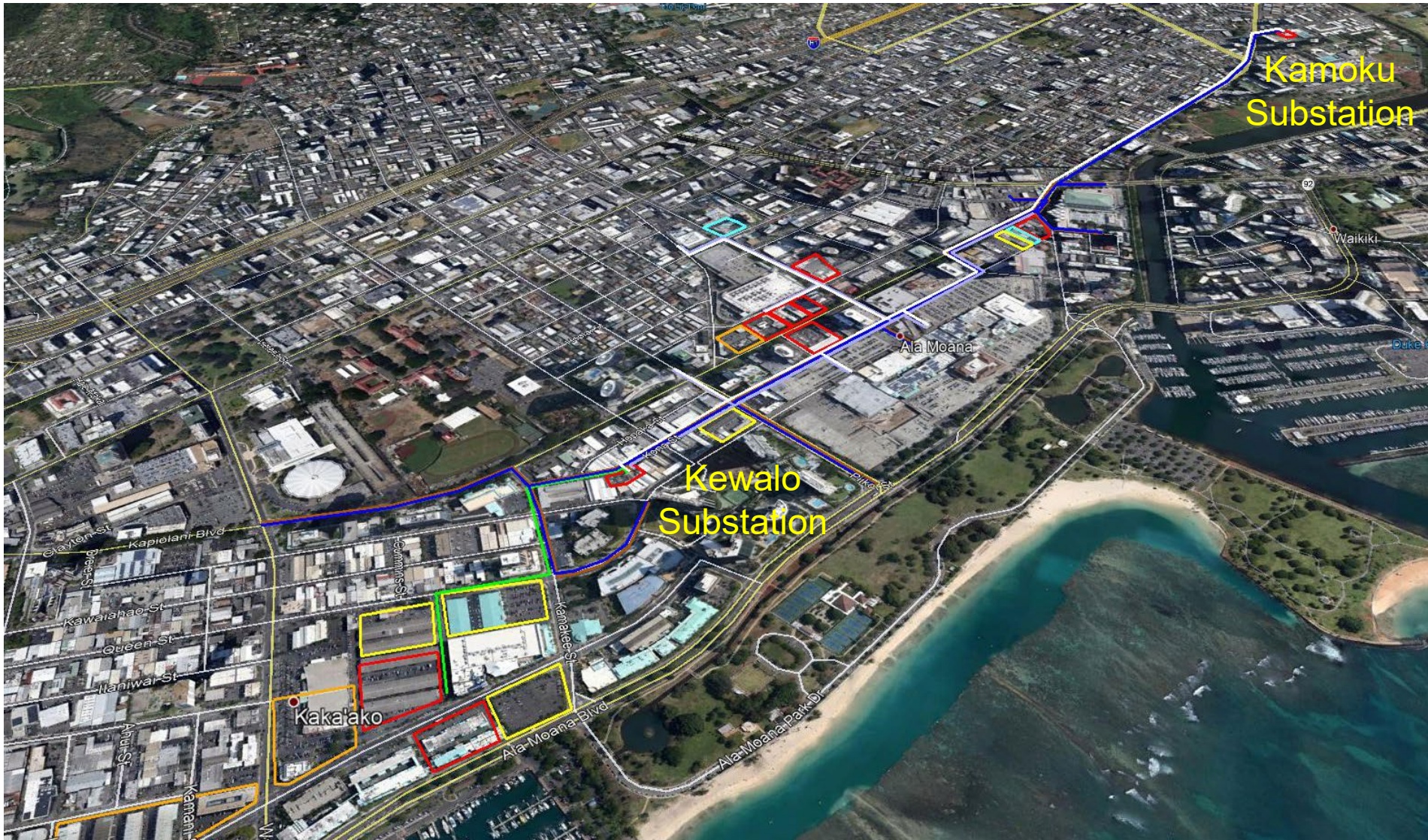




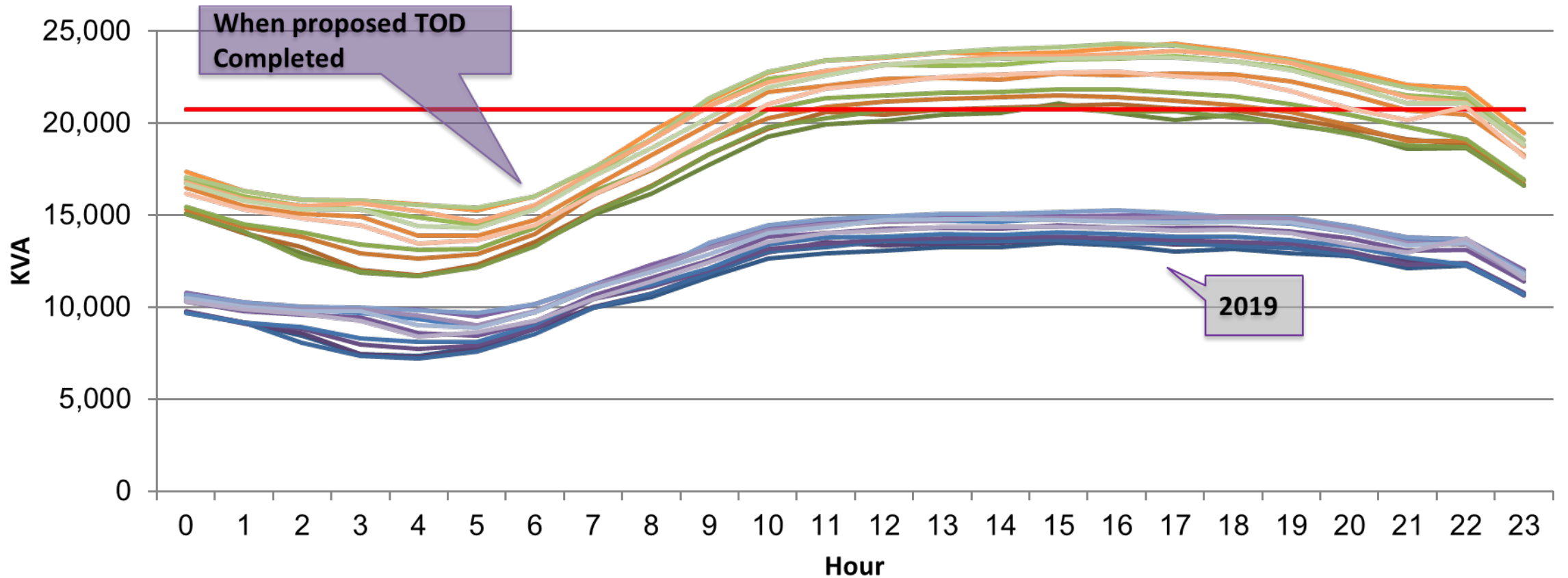
# Ala Moana Area Transit Oriented Development (TOD)

- ◆ TOD related service requests received from developers
  - ◆ Hawaii City Plaza (near Wal-Mart/Sam's Club)
  - ◆ Azure Ala Moana (near Walgreens)
  - ◆ The Central Ala Moana (between Kapiolani and Kona near Ala Moana rail station)
  - ◆ Mandarin Oriental Hotel and Residences (near the Convention Center)
  - ◆ Sky Ala Moana (next to Pacific Guardian)
  - ◆ Hawaii Ocean Plaza (next to Sky Ala Moana)
- ◆ TOD related service requests expected soon
  - ◆ KC Rainbow Development Company Project (between Mandarin and the new Kapiolani Residences)
  - ◆ Keeaumoku International Village Development (Sorabol site)

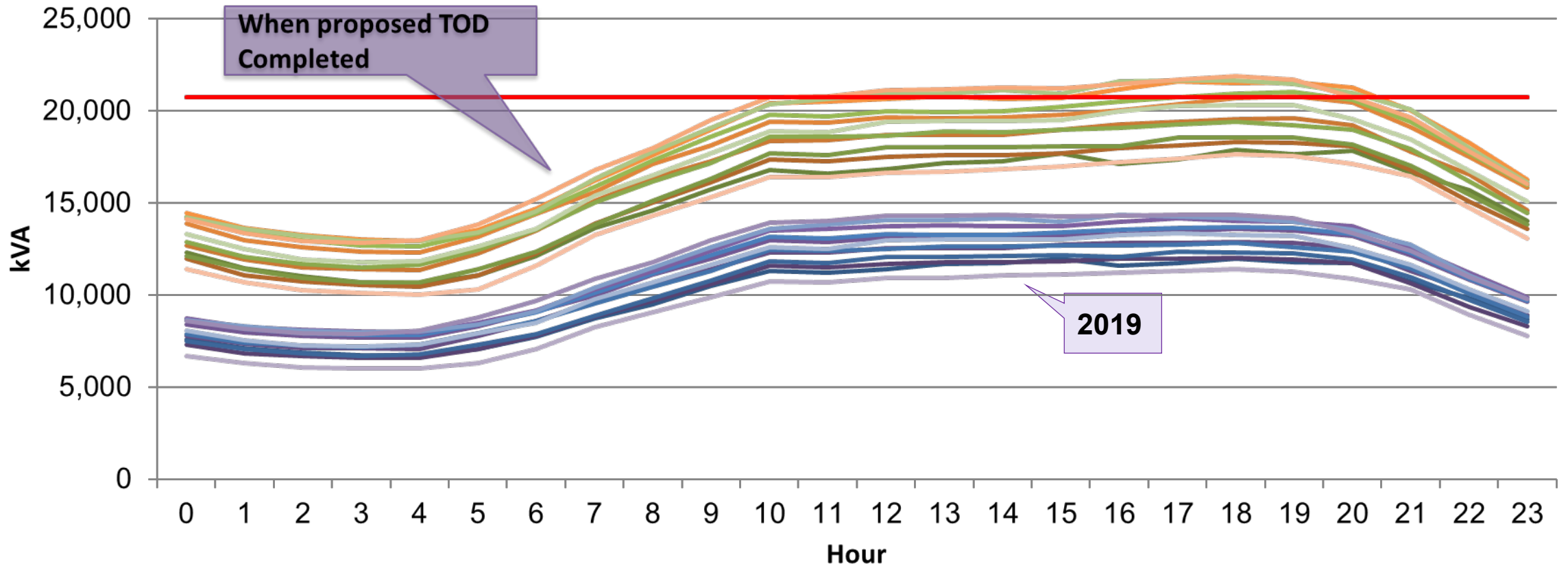




# Kewalo 6 and Kamoku 10 Circuit Loading (N-1 Condition)



# Kewalo 5 and Kamoku 9 Circuit Loading (N-1 Condition)



# NWA Prioritization: Ala Moana Area TOD

- ◆ Qualified or non-qualified NWA opportunity?
- ◆ If qualified, how should this opportunity be prioritized based on the proposed metrics?
  - ◆ What technologies are available to meet the identified need?

Track	Grid Need	Performance Requirements	Timing	Forecast Certainty	Market Assessment	Economic Assessment
	Project A					





# LINE RELOCATION PROJECT

## OVERHEAD (OH) TO UNDERGROUND (UG) CONVERSION

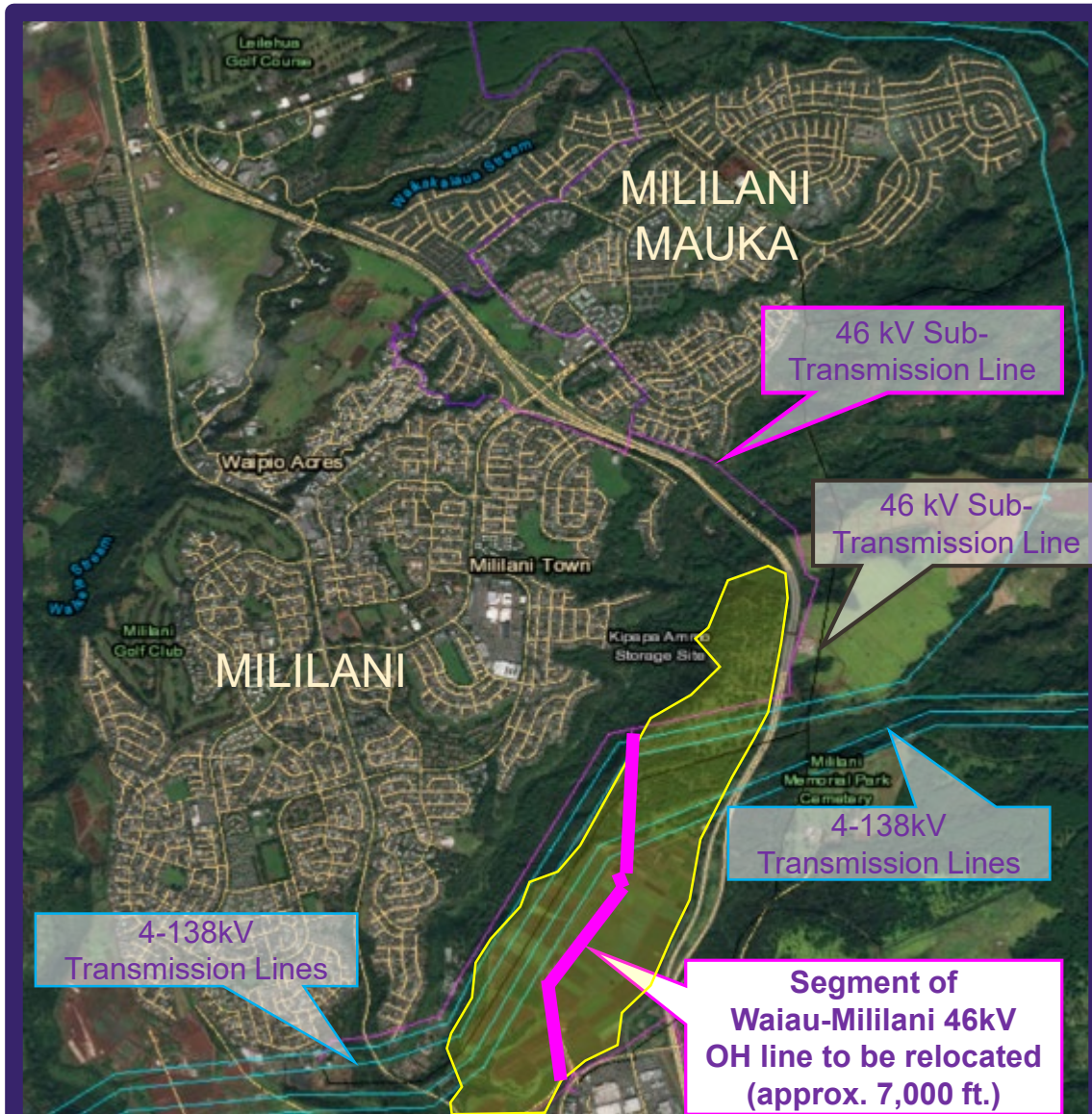


# Waiau-Mililani 46 KV OH to UG Conversion

- ◆ Customer requested OH to UG conversion projects in support of the Koa Ridge Development
- ◆ Scope of Work:
  - ◆ Install overhead and underground electrical facilities
  - ◆ Remove existing overhead electrical facilities once underground facilities are energized
- ◆ Road C Phases 1 & 2 projects require PUC approval because of the relocation of the 46kV line.
- ◆ In-Service Dates vary between 2020 and 2021
- ◆ Project Cost: \$ 6.5 M
- ◆ HECO Cost (less customer contributions “CIAC”): ~\$800,000



# Waiau-Mililani 46KV OH Line Removal



Downstream of Project primarily serves and backs up:

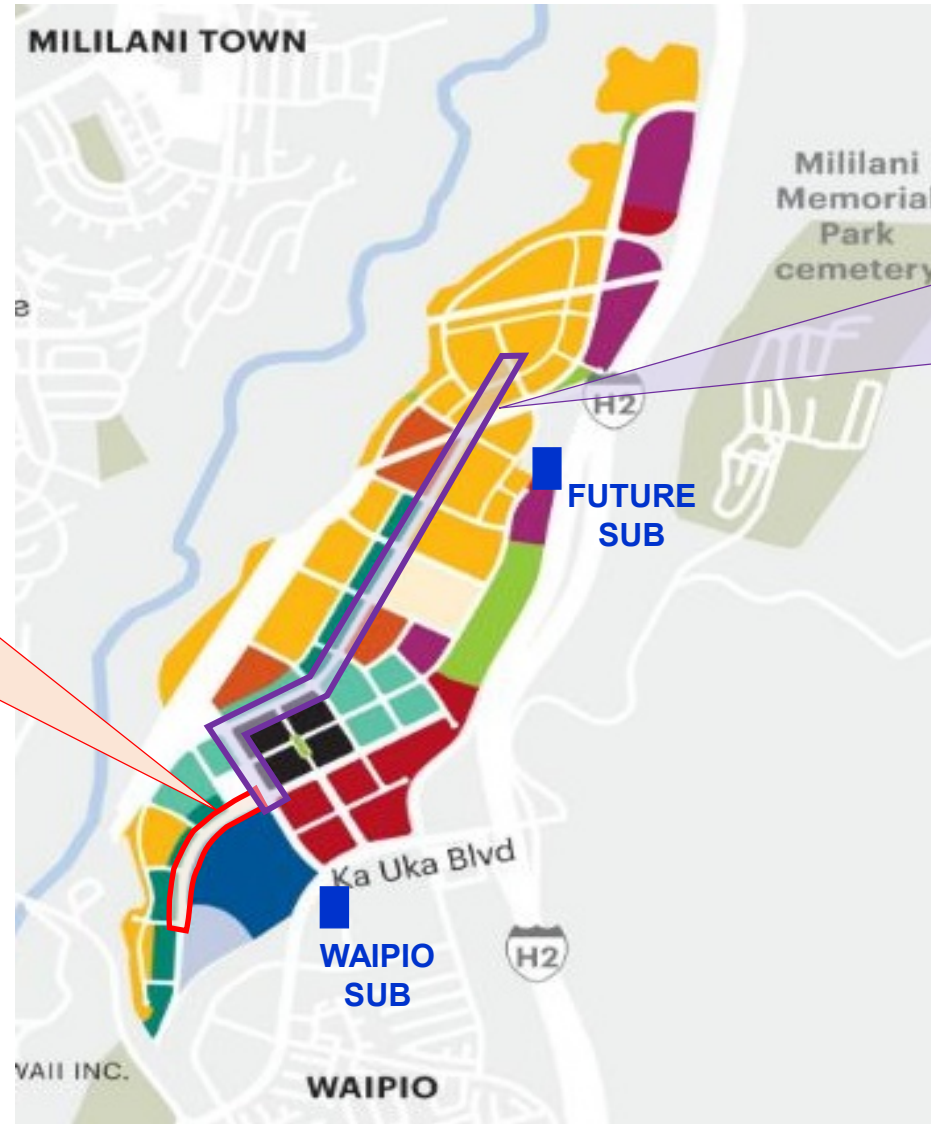
- Mililani area (Mililani & Uwapo Subs)
- Mililani Mauka area (Upper Kipapa Sub)

Circuit distributes roughly a peak load of 30 MW to these communities 24x7.





# Waiau-Mililani 46KV UG



**Road A Ph2/Rd B Ph1**  
**Budget: \$2.8M**  
**In-Svc Date: 11/2019**  
**Funding: CIAC + HECO**  
**(One-time relocation/betterment)**

**Road C Ph1B**  
**Budget: \$3.7M**  
**In-Svc Date: 10/2021**  
**Funding: CIAC + HECO**  
**(One-time relocation/betterment)**



# NWA Prioritization: Waiau-Mililani OH-UG Relocation

- ◆ Qualified or non-qualified NWA opportunity?
- ◆ If qualified, how should this opportunity be prioritized based on the proposed metrics?
  - ◆ What technologies are available to meet the identified need?

Track	Grid Need	Performance Requirements	Timing	Forecast Certainty	Market Assessment	Economic Assessment
	Project A					



# LINE RELOCATION PROJECT

## OVERHEAD TO OVERHEAD RELOCATION



# Salt Lake Blvd Overhead (OH) Lines Relocation

- ◆ Due to the widening of Salt Lake Blvd., the City requires HECO's existing facilities along Salt Lake Blvd. (between Namur Road and Ala Lilikoi Street) be relocated.
- ◆ Scope of Work
  - ◆ Relocate existing 46kV (Makalapa 46), 12kV (Makalapa-Moanalua) OH lines and secondary poles; also
  - ◆ Relocate existing UG cables that come from riser poles to the relocated pole locations
  - ◆ Estimated distance between P.133 and P.108A along Salt Lake Blvd.
    - ◆ 46kV line: approx. 5,100 ft.
    - ◆ 12kV line: approx. 5,000 ft.
  - ◆ 5 secondary poles affected; total 34 poles may get affected
- ◆ Anticipated in-service date is 2023
- ◆ Relocating existing facilities does not affect the circuit configuration or services provided by the circuits
- ◆ High-level project cost is roughly \$1.5 M

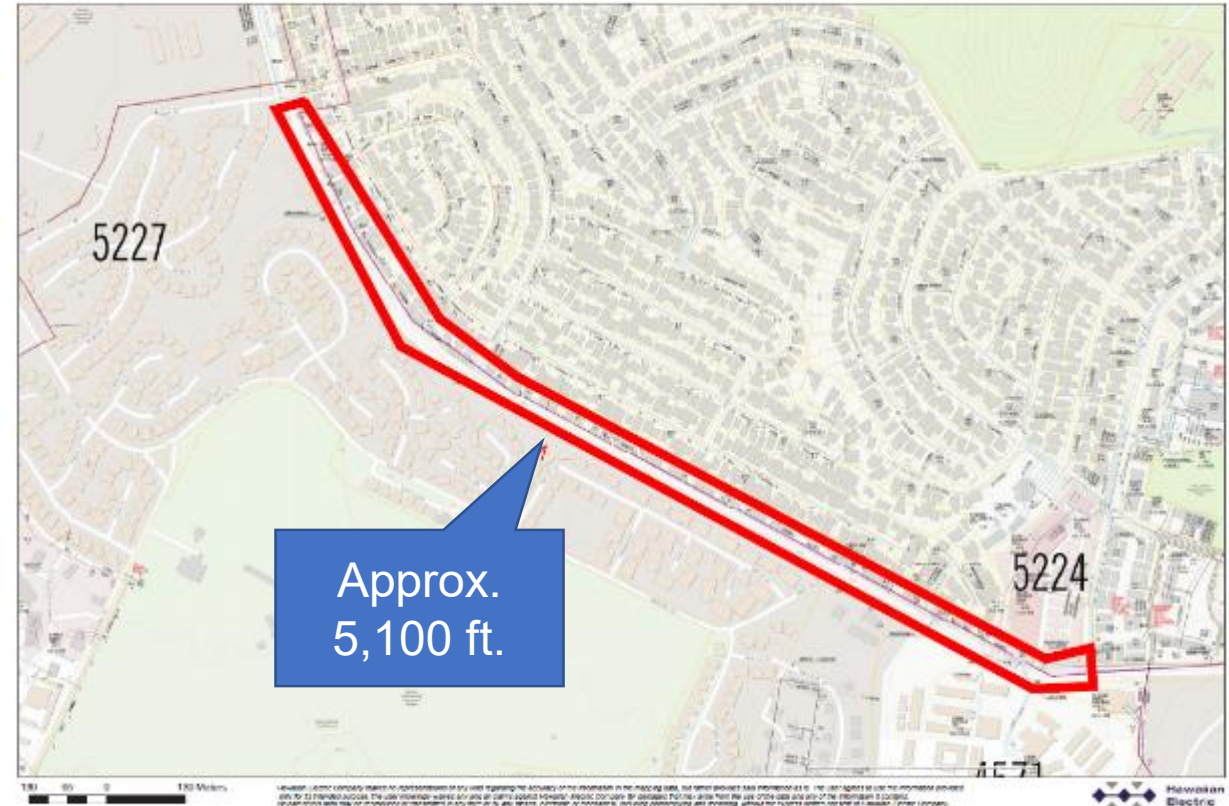
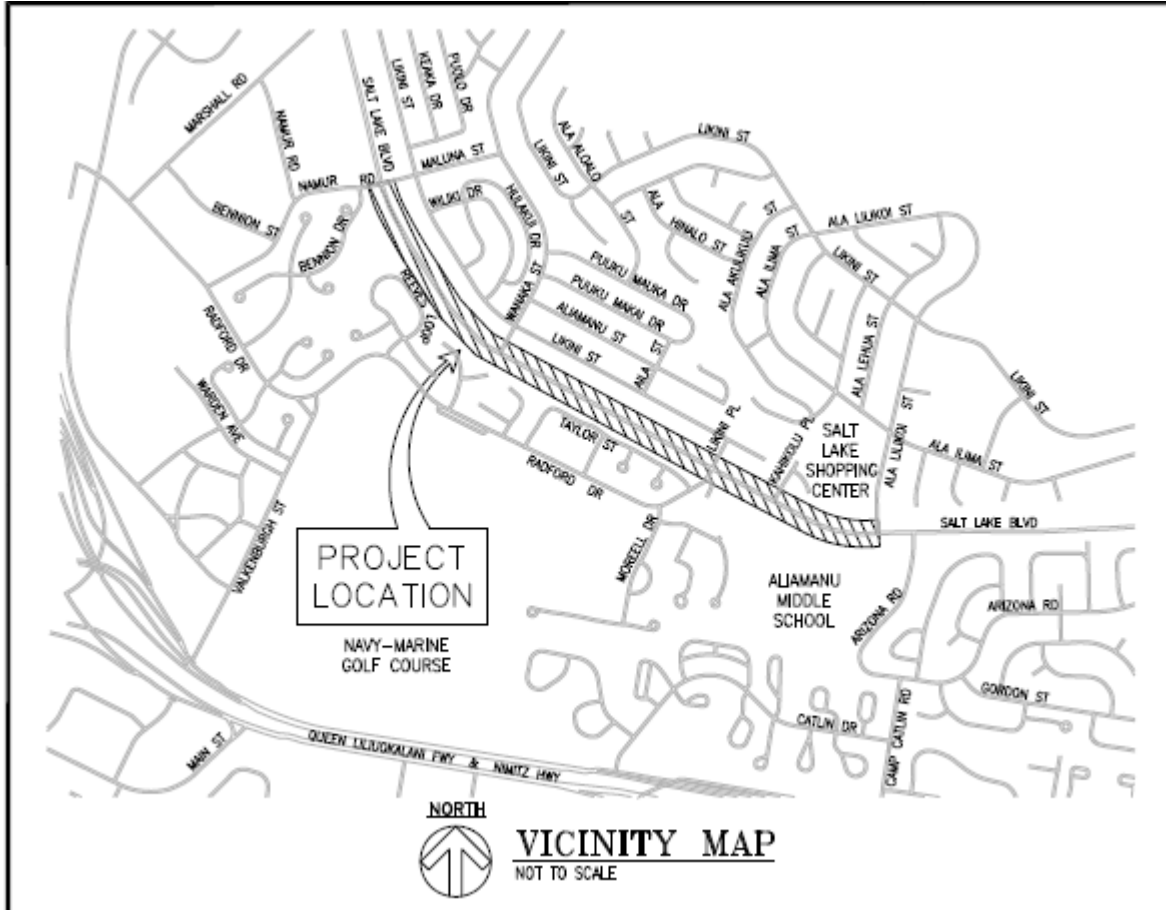


# Salt Lake Blvd Overhead (OH) Lines Relocation

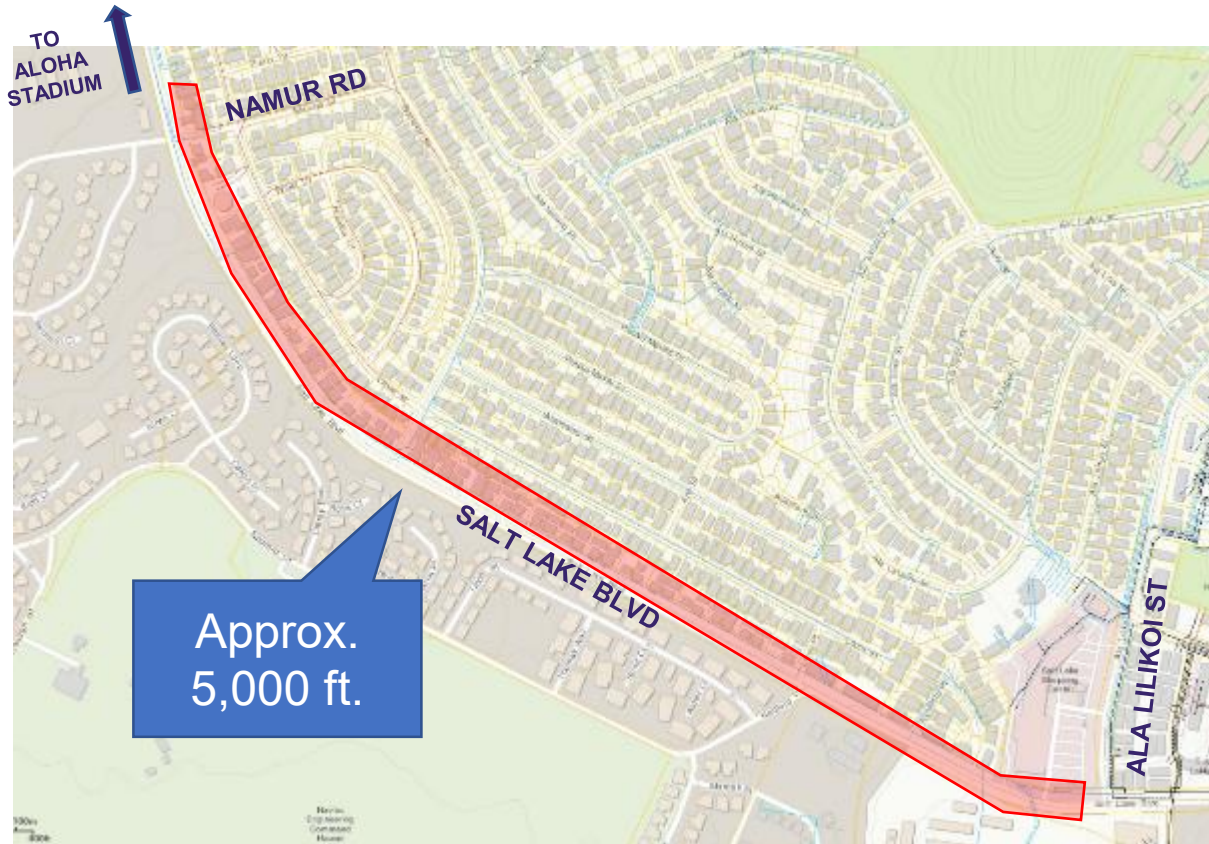
- ◆ MAKALAPA 46 46kV circuit primarily serves
  - ◆ Salt Lake/Aliamanu areas (Lakeside Sub)
  - ◆ Airport/Keehi areas (Keehi & Lagoon Subs)
- ◆ MAKALAPA-MOANALUA 12kV circuit primarily serves
  - ◆ Salt Lake shopping center
  - ◆ Aliamanu elementary/middle schools
- ◆ 46kV Circuit distributes roughly a peak load of 25 MW to these communities 24x7.



# Salt Lake Blvd 46KV Line Relocation



# Salt Lake Blvd 12kV Line Relocation



Loads are being served from OH lines along Salt Lake Blvd.



Hawaiian Electric  
Maui Electric  
Hawai'i Electric Light

# Salt Lake Blvd 12KV Line Relocation





# NWA Prioritization: Salt Lake Blvd. Relocation

- ◆ Qualified or non-qualified NWA opportunity?
- ◆ If qualified, how should this opportunity be prioritized based on the proposed metrics?
  - ◆ What technologies are available to meet the identified need?

Track	Grid Need	Performance Requirements	Timing	Forecast Certainty	Market Assessment	Economic Assessment
	Project A					



# REPLACEMENT OF AGING INFRASTRUCTURE



# Waiau New 46kV GIS Bus Replacement

- ◆ This project will replace the existing deteriorated 46kV air insulated Switchyard with a new 46kV gas insulated (GIS) Substation. Major 46 kV switching station provides service to Waiau, Ewa, Mililani, Pearl City, Waipahu through 8-sub-transmission lines.
- ◆ Findings from B&V 's “Waiau 46kV Substation Engineering Study” dated 2013
  - ◆ Substation is well beyond its design life (66+ years in marine environment)
  - ◆ Bus configuration that creates risk of major outage and is expensive to operate
  - ◆ Severely corroded steel structure
  - ◆ Inadequate grounding system, creating potential hazard to public
  - ◆ Aged, obsolete, and unreliable equipment providing unreliable service
  - ◆ Inadequate housing for modern protective relays



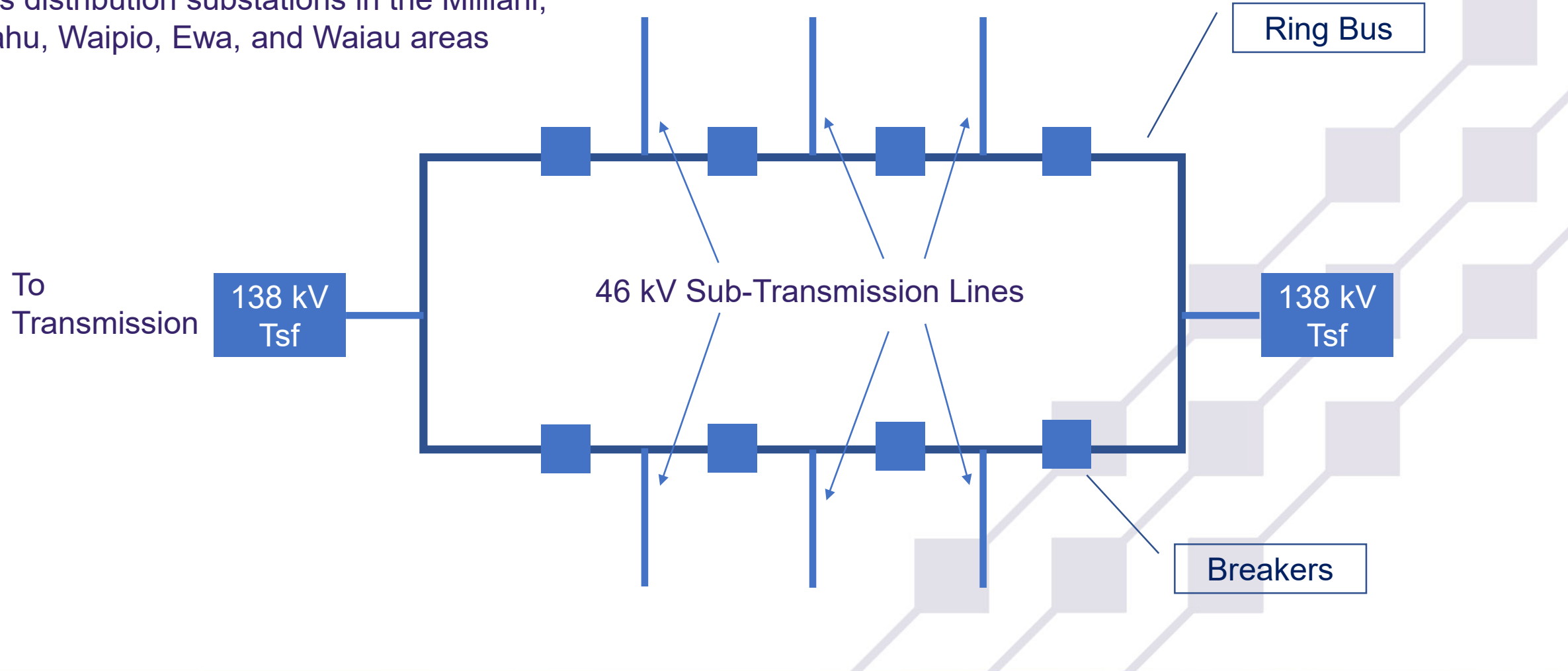
# Waiau New 46kV GIS Bus Replacement

- ◆ Scope of work includes:
  - ◆ Installing new 46kV GIS ring bus (circuit breakers are connected to form a **ring**, with isolators on both sides of each breaker)
  - ◆ Reconnecting:
    - ◆ Six 46 kV sub-transmission lines
    - ◆ Two 138-46 kV 80 MVA transformers
    - ◆ Two 7.5 MVA start up transformers for the Waiau Power Plant
  - ◆ Connections/space for Waiau generating units 3 and 4
  - ◆ Constructing a new 46 kV control house, with provisions for future 138 kV relays
- ◆ In-service date: January 2024
- ◆ Bus Load (2018): 92 MW
- ◆ Project Cost: \$60M



# Waiau New 46kV GIS Substation

Serves distribution substations in the Mililani, Waipahu, Waipio, Ewa, and Waiau areas



# NWA Prioritization: Waiau Substation Replacement

- ◆ Qualified or non-qualified NWA opportunity?
- ◆ If qualified, how should this opportunity be prioritized based on the proposed metrics?
  - ◆ What technologies are available to meet the identified need?

Track	Grid Need	Performance Requirements	Timing	Forecast Certainty	Market Assessment	Economic Assessment
	Project A					



# Next Steps

- ◆ **Stakeholder feedback on upcoming agenda topics**
- ◆ **Next meeting:**
  - ◆ November - TBD
- ◆ **Please send any additional comments on proposed approach to:**
  - ◆ [IGP@hawaiianelectric.com](mailto:IGP@hawaiianelectric.com) and Marc Asano ([marc.asano@hawaiianelectric.com](mailto:marc.asano@hawaiianelectric.com))



# Appendix – Refresher Material NWA Opportunity Evaluation Criteria





# T&D NWA Opportunity Evaluation

**Goal:** Identify all potential T&D candidate projects for NWA, that can be cost effectively deferred through DER services.

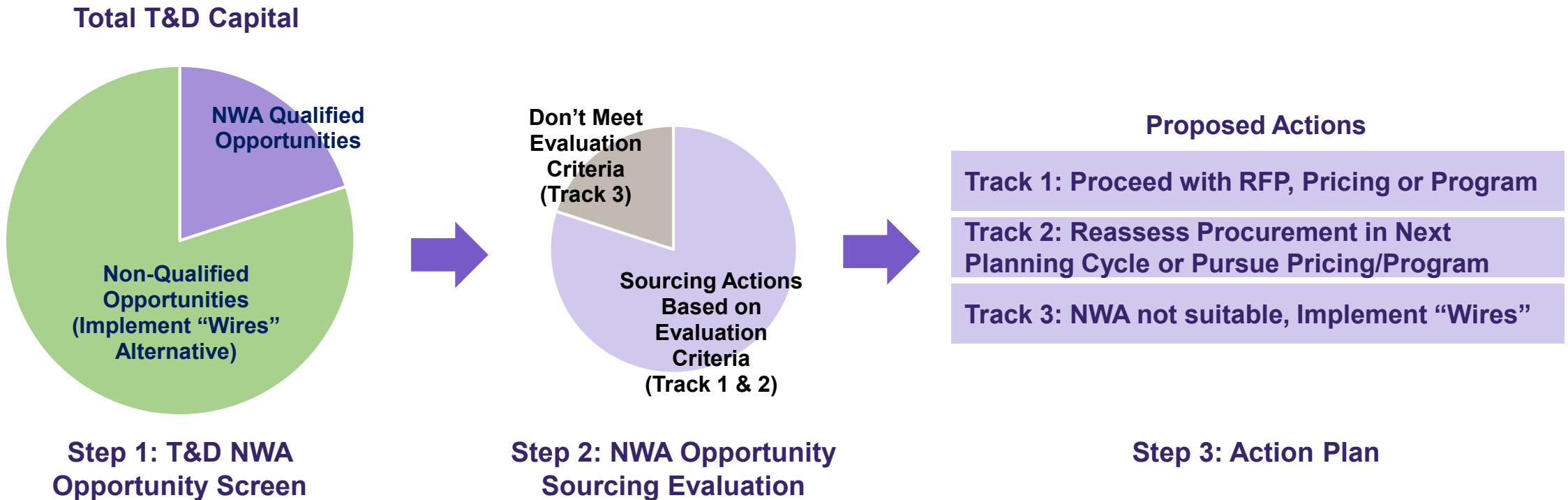
## **Objectives:**

- ◆ Adopt/adapt leading practices to develop T&D NWA candidate project opportunity evaluation
- ◆ Initial NWA screens should create over-inclusive, rather than overly restrictive, candidate NWA project shortlists
- ◆ Utilize simple initial NWA opportunity screen to identify shortlist candidate opportunities and conduct assessment of sourcing options (procurement, programs & pricing)
- ◆ Not all NWA opportunities will be sourced via competitive procurement. Pricing (tariffs) and DER programs will also be considered to achieve the most affordable solutions for customers.



# T&D Project Qualification & NWA Opportunity Assessment

T&D opportunities are filtered through process to identify appropriate sourcing approach or determine “wires” alternative is best course of action



# Step 1: T&D Project NWA Qualification

*Categorize capital budget projects and apply opportunity screen to down select projects for NWA opportunity evaluation.*

- ◆ Projects are those associated with T&D needs identified in T&D Planning and Resource Procurement, such as:
  - ◆ Expansion of Distribution System Capacity (i.e., new substation, new feeders, re-conductoring)
  - ◆ Reliability requirement for circuit back-tie upgrade deferral
  - ◆ Voltage/reactive power support
- ◆ However, certain expenditures cannot be deferred/avoided by DER, such as:
  - ◆ Line/pole relocation (i.e., street widening, re-location clauses, OH to UG conversions)
  - ◆ New customer service connection
  - ◆ Equipment/Infrastructure failure replacement (i.e., replacements to prevent equipment failure or for safety)
- ◆ T&D needs that may be met by NWA services include:
  - ◆ T&D capacity deferral service
  - ◆ Reliability back-tie service
  - ◆ Voltage/Reactive Power service
  - ◆ Resilience service



# T&D Project NWA Qualification Filter

Identify all T&D opportunities into 2 categories:

**A. Projects to conduct Step 2: NWA Opportunity Sourcing Evaluation, and**

**B. Projects that meet the following exception criteria for “wires” implementation:**

- ◆ Where necessary to provide connection in response to customer service and/or resource interconnection requests
  - ◆ Where DER is not a substitute for customer requests to provide new physical connection to the electric grid
  - ◆ Where DER is not substitute for requested physical grid connections
- ◆ Where necessary to address maintenance, asset condition or safety needs
  - ◆ Projects involving preventative replacement to avoid outages, catastrophic failures and ensure public safety
  - ◆ Where DER is not a substitute for physical apparatus such as circuit breakers, relays, transformers that need to be replaced due to asset condition.
- ◆ Necessary to replace damaged or failed equipment/poles/conductor
  - ◆ Projects involving emergency replacement after event often as part of outage restoration
  - ◆ DER is not substitute for permanent replacement of physical apparatus during an emergency event
- ◆ Necessary to comply with public works requests (i.e., pole/conductor/cable relocation)
  - ◆ Projects involving temporary or permanent physical relocation of existing infrastructure to accommodate public works/transportation projects



## Step 2: T&D NWA Opportunity Evaluation

- ◆ Intended to evaluate candidate T&D projects as viable NWA opportunities and prioritize resulting NWA opportunities.
- ◆ Evaluation Criteria:
  - ◆ **Performance** in relation to engineering/operational performance requirements
  - ◆ **Timing** of when needed in relation to sourcing duration and any related approval process time
  - ◆ **Forecast certainty** regarding the timing and scope of the grid “need”. (e.g., how certain is the increased load from a new commercial development – has a service request been submitted?)
  - ◆ **Market assessment** is based on assessing the potential for successful NWA solution development.
  - ◆ **Economics** will be based on the deferral value of a qualified T&D capital project and any other relevant avoided costs.



# Step 2: T&D NWA Opportunity Evaluation Criteria

## Performance Requirements

- ◆ Determine whether NWA solutions can reasonably meet the performance requirements of the identified grid need
- ◆ Requirements based on T&D NWA grid services defined

## Timing

- ◆ Establish minimum lead times for NWA opportunity sourcing for:
  - ◆ IGP NWA Competitive procurements
  - ◆ Programs and Pricing options
- ◆ The cut-off timing will be based on the length of time to conduct the procurement, program or rate design, any regulatory approval and implementation in relation to the forecasted operational date
- ◆ The cut-off timing must also reflect the period to implement a wires solution should the procurement, program or pricing not yield an acceptable alternative by the operational date



# Step 2: T&D NWA Opportunity Evaluation Criteria

**Forecast Certainty** will be assessed in terms of high and low certainty:

- ◆ High certainty opportunities involve nearer term needs that have less historical load/DER growth volatility driving the need and required in-service date.
- ◆ Low certainty opportunities involve longer-term needs that have more historical load/DER growth volatility driving the need and required in service date.

**Market Assessment** will initially assess three aspects in terms of high/low priority:

- ◆ Technical potential based on number of customers available for BTM solutions and land availability for ATM solutions
- ◆ Complexity of potential solutions in relation to the complexity of the grid need
- ◆ Supplier and solution diversity to ensure competitiveness and reliability

**Economics** will be assessed in terms of the T&D project avoided cost as well as the cost of a procurement and/or program/pricing implementation costs and relative attractiveness to customers.

- ◆ This will be used to prioritize opportunities for procurement, programs and/or pricing
- ◆ May also identify opportunities that are unlikely to be cost effective



# Step 3: Proposed T&D NWA Opportunity Sourcing

*NWA Opportunity sourcing assessment assigns projects into 3 action plan tracks based on the evaluation criteria*

- **Track 1: Procurement** Large, certain opportunities with high likelihood of NWA success for procurement (i.e., green on performance, timing, forecast certainty and either green or yellow on market and economics)
- **Track 2: Reassess Procurement or Pursue Program** Opportunities that can address performance and timing, but have factors that indicate reevaluating in the future for potential procurement if due to forecast uncertainty or pursue pricing and programs. (i.e., green on performance & timing and minimally yellow on other criteria)
- **Track 3: Not Qualified** Opportunities that have criteria (e.g., performance, timing, economics) that cannot be reasonably met by NWA solutions and so “wires” solution will be implemented.

Track	Grid Need	Performance Requirements	Timing	Forecast Certainty	Market Assessment	Economic Assessment
1	Project A	5hr Peak Load Reduction	Jan 2023-Dec 2027	High	High	\$600k/yr Avoided Cost
2	Project B	4hr Peak Load Reduction	Jan 2024-Dec 2028	Medium	Medium	\$250k/yr Avoided Cost
3	Project C	24x7 Load Reduction	Jan 2023-Dec 2027	High	Low	\$25k Avoided Cost

