

# T&D NWA Opportunity Identification & Evaluation

Distribution Planning Working Group

July 17, 2019



Hawaiian Electric  
Maui Electric  
Hawai'i Electric Light

# Agenda

- ◆ Introductions & Meeting Objectives
- ◆ Soft Launch Update
- ◆ Industry Leading Practices
- ◆ Proposed NWA Identification & Sourcing Process
- ◆ Proposed NWA Opportunity Evaluation Criteria

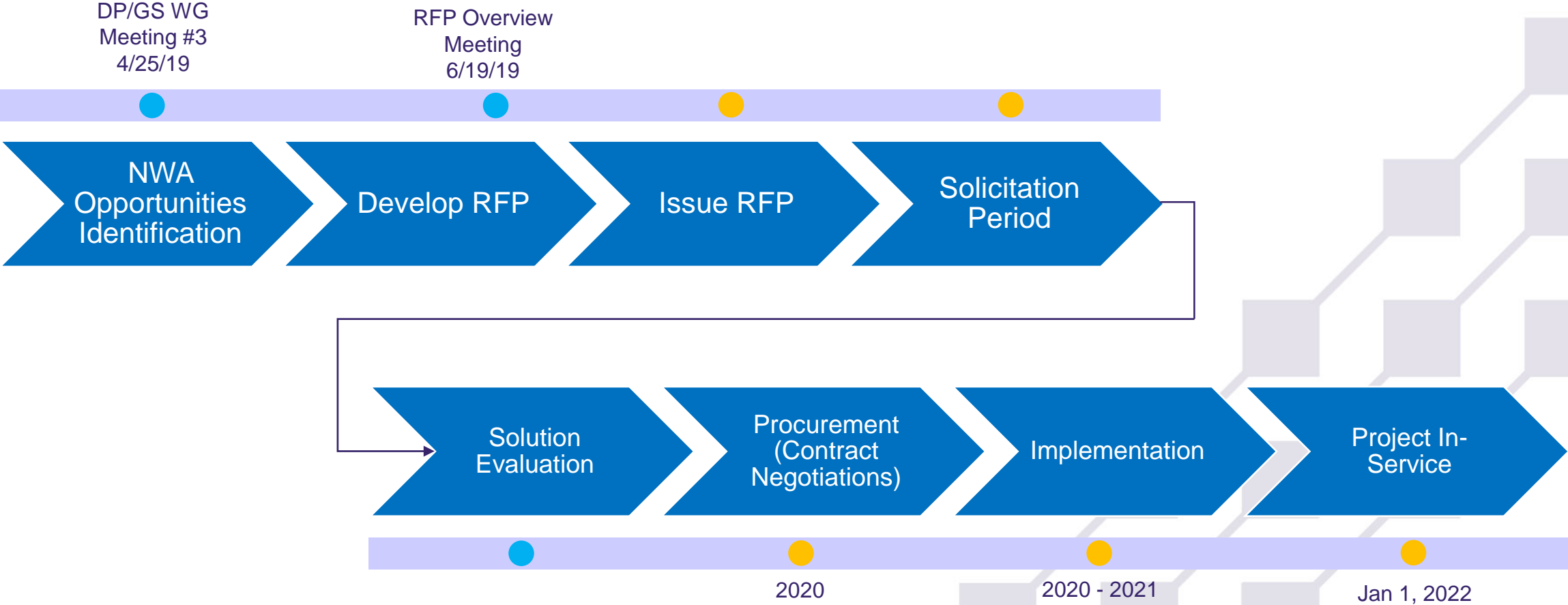


# Meeting Objectives

- ◆ Continuation of Distribution Planning & NWA discussions from the Soft Launch Working Group Meetings
- ◆ Next 2 meetings to discuss:
  - ◆ Proposed annual distribution planning and IGP integration for NWA opportunity evaluation & sourcing
  - ◆ Proposed NWA opportunity evaluation process and methodology
  - ◆ Stakeholder feedback in discussion and presentations



# Soft Launch Update



# Industry Leading Practices



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# Mainland Survey of NWA Opportunity Screening Process

- ◆ Conducted best practices workshop in SLWG Mtg #2
- ◆ Surveyed states with NWA regulatory rules:
  - ◆ California
  - ◆ New York
  - ◆ Rhode Island
  - ◆ New Hampshire
  - ◆ Maine
- ◆ Interviewed CA utilities on implementation of CPUC rules



# NWA Opportunities

(Source: RMI Best Practices Paper)

- ◆ Traditional planning processes can better support NWAs, if screening criteria are used to determine when NWA should be considered for a given need.
  - ◆ Effective evaluation processes should *“Identify high-confidence recommendations for DER solicitations that are likely to result in successful, cost-effective investment deferrals.”* CPUC
  - ◆ Opportunity evaluation screens *“should screen out the deferral opportunities that have a low probability of success.”* CPUC
- ◆ Planners can apply criteria related to need characteristics like cost, timing, and type to screen if a non-wires solution project is likely to be viable.
- ◆ This screening encourages productive market engagement by helping utilities and developers efficiently allocate resources to the best non-wires solution opportunities.
- ◆ While a helpful prioritization tool for a nascent non-wires solution market, as utilities gain more NWA experience screening criteria can evolve to be more inclusive of a wider universe of potentially viable NWA.



# NWA Lessons Learned

## *Key takeaways from SLWG #2 Mtg presentations*

- ◆ NWA opportunities require alignment of utility needs and DER service capabilities, costs and financing considerations to be successful
- ◆ Lessons learned from initial NWAs across the US are that not all T&D projects are suited for cost-effective DER deferral.
  - ◆ States currently conducting NWA sourcing do not include distribution capital projects involving break-fix, outage replacements, aging infrastructure replacement, infrastructure relocation or customer service connections in scope as these do not meet suitability criteria.
  - ◆ For potential deferral projects:
    - ◆ Long duration operational needs limits feasible technologies and increase costs. The long duration needs (hours, months) also limits the counterparty's ability to monetize other revenue streams.
    - ◆ DER providers need sufficient contract length to enable financially viable offers – this needs to be balanced with the uncertainty of the length of time for grid need to avoid stranded costs





# NWA Lessons Learned (cont.)

*Key takeaways from SLWG #2 mtg presentations*

- ◆ Procurements may not be best suited for all NWA opportunities (e.g., smaller value projects and/or reaching certain customer classes)
  - ◆ Targeted EE/DSM Programs are employed
  - ◆ DER Services tariffs are under discussion in a few states
- ◆ Other NWA procurement lessons learned that can be used going forward are:
  - ◆ It can be complicated to combine multiple small offers to meet the distribution deferral need,
  - ◆ Negotiating contract terms remains a learning exercise for both parties (i.e., utility and the counterparties), and
  - ◆ Streamlining regulatory approvals process may help improve DER viability and reduce uncertainty.
- ◆ States/utilities do consider low cost operational (e.g., circuit reconfiguration, phase balancing, etc.) and technology alternatives (e.g., sensing & analytics, power flow controllers, etc.) to traditional capital projects as part of the “alternatives” analysis



# New York NWA Opportunity Screens

Criteria	Potential Elements Addressed	
Project Type Suitability	Project types include Load Relief and Reliability. Other types have minimal suitability and will be reviewed as suitability changes due to State policy or technological changes.	
Timeline Suitability	Large Project	36-60 months
	Small Project	18-24 months
Cost Suitability	Large Project	Greater than or equal to \$1M
	Small Project	Greater than or equal to \$500K

Source: National Grid 2017

- Con Edison does not have a cost floor for the large projects, all the large projects that had sufficient time to be implemented were selected as potential opportunities and shown in the table below.
- For small projects, the \$450K cost floor was used in addition to the need date to determine the non-wires alternative opportunities.

Criteria	Potential Elements Addressed	
Project Type Suitability	<ul style="list-style-type: none"> <li>• Project types include Load Relief or Load Relief in combination with Reliability. Other categories have minimal suitability and will be periodically reviewed for potential modifications due to State policy or technological changes.</li> </ul>	
Timeline Suitability	<b>Large Project</b> (Projects that are on a major circuit or substation and	<ul style="list-style-type: none"> <li>• 36 to 60 months</li> </ul>
	<b>Small Project</b> (Projects that are feeder level and below)	<ul style="list-style-type: none"> <li>• 18 to 24 months</li> </ul>
Cost Suitability	<b>Large Project</b> (Projects that are on a major circuit or substation and	<ul style="list-style-type: none"> <li>• No cost floor</li> </ul>
	<b>Small Project</b> (Projects that are feeder level and below)	<ul style="list-style-type: none"> <li>• Greater than or equal to \$450k</li> </ul>

Source: ConEdison 2017



# Rhode Island NWA Opportunity Screens

NWA Suitability Criteria in Rhode Island	
1.	The need is not based on asset conditions
2.	The wires solution will cost more than \$1 million
3.	If load reduction if necessary, it is expected to be less than 20 percent of the relevant peak load in the area of defined need
4.	Start of wires alternative construction is at least 36 months in the future
The utility may propose a project that fails to meet one or more of the above criteria if it has reason to believe that a viable NWA solution exists, assuming the benefits justify the costs	

*Source: Rhode Island System Reliability Procurement Law*



# Maine NWA Law LD 1181

## Annual Distribution Plan

- ◆ Analyze system needs for the next 5 years and provide a schedule of proposed projects and associated costs;
- ◆ Identify corresponding planned and anticipated growth-related investments.
- ◆ Shall investigate non-wires alternatives if the project is a small transmission project or is a distribution project estimated to cost \$500,000 or more; and
- ◆ May investigate non-wires alternatives if the project is a distribution project estimated to cost less than \$500,000 if there is a reasonable likelihood that a non-wires alternative would be more cost-effective than the proposed distribution project.

## Excluded Projects Criteria

- ◆ The commission, by rule, shall develop criteria to exclude from investigation small transmission projects and distribution projects best suited to transmission and distribution investments, including but not limited to projects that are:
  - ◆ Necessary for redundant supply to a radial load;
  - ◆ Necessary to address maintenance, asset condition or safety needs;
  - ◆ Necessary to address stability or short circuit problems; or
  - ◆ Required to be in service within one year based on the controlling load forecast.



# New Hampshire NWA Opportunity Screen

Liberty's NWA Evaluation Process <sup>15</sup>	
Step	Description
Review Demand Forecast	Review demand forecasts prepared for each substation, sub-transmission line, and feeder under extreme weather scenarios to determine if capacity is adequate to meet demand under normal and contingency configurations
Review T&D Deficiencies	Develop a list of distribution deficiencies based on planning criteria.
Screen Projects based on Screening Criteria	<ul style="list-style-type: none"> <li>• Distribution deficiency is not based on asset condition;</li> <li>• Distribution deficiency needs to be addressed in no less than two years, allowing for development of a NWA solution;</li> <li>• Wires solution, based on engineering judgement, will likely cost more than \$0.5 million, providing sufficient cost savings to evaluate and implement a NWA solution;</li> <li>• Wires solution will likely start construction at least 24 months in the future, providing sufficient time to evaluate and implement a NWA solution; and</li> <li>• A NWA solution would be for less than 20 percent of the total load in the area of the distribution deficiency.</li> </ul>
Evaluate NWA solutions for technical feasibility	Review potential NWA solutions for technical feasibility: alternatives that have successfully reduced, avoided or deferred a wires solution in the region

Source: Liberty 2017 (New Hampshire)



# California NWA Opportunity Evaluation

Screens used to “Identify which projects are most likely to result in successful, cost-effective deferrals that provide needed grid services.” CPUC adopted **Timing** and **Technical** screens for prioritizing potential NWA opportunities into a short list for procurement:

## ◆ **Timing:**

- ◆ Minimum project lead-times are primarily driven by the CPUC prescribed RFP, proposal evaluation and approval process, and not necessarily by the time needed to deploy modular DER solutions.
- ◆ CPUC expects the Timing screen to evolve as the IDER proceeding develops non-RFO based DER sourcing mechanisms (e.g., DER services tariff or programs).

## ◆ **Technical:** 3 Prioritization metrics are used:

- ◆ Economic/Financial: “a deferral project would likely result in net ratepayer benefits”
- ◆ Forecast Certainty: “forecast grid need underlying a potentially deferrable investment is likely to materialize”
- ◆ Market Assessment: “potential DER marketplace within the electrical footprint provides an adequate market opportunity to host DER solutions.”



# California: Forecast Certainty Prioritization Factor

- ◆ **Forecast Certainty** factor is based on project timing certainty.
- ◆ Opportunities 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.

Table 4. IOU prioritization metrics from IDER Incentives Pilot related to Forecast Certainty

Utility	Metric	High Priority	Low Priority
PG&E	Number of customers causing need	Many	Few
	Project need (absolute and percent)	Large	Small
	Timing of need	Near-term	Long-term
SCE	Project timing certainty	Nearer-term needs; less historical volatility with load growth driving project need and required in-service date	Longer-term needs; more historical volatility with load growth driving project need and required in-service date
SDG&E	Weather factor adjustment	Average weather factors applied to the circuit or substation compared to overall system	Above-average weather factors applied to the substation or circuit compared to overall system
	Customer-specific development	Customer submittals for new or additional load	External reports of possible new developments

Utility	Metric	High Priority	Low Priority
	Customer growth	Multiple customer requests for new load, ground breaking ceremonies, and load materializing	No submittals for future load additions
	Historical Load	Forecast peak represents a relatively minimal increase or decrease from recent years' recorded peak	Forecast peak represents a relatively significant increase from recent years' recorded peak



# California: Market Assessment Prioritization Factor

- ◆ **Market Assessment** factor is based on assessing the potential for successful NWA solution development.
- ◆ 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

Table 5. IOU prioritization metrics from IDER Incentives Pilot related to DER Market Assessment

Utility	Metric	High Priority	Low Priority
PG&E	Number of customers causing need	Many	Few
	Ratio of projected need to customers/load on circuit/bank	Small	Large
	Timing of need	Long-term	Near-term

*Not Accepted*

SCE	Market assessment (customer composition)	Broad base of large customers contributing to peak load (requires engaging relative residential customer base to meet distribution need)	Minimal number of large customers contributing to peak load, or highly residential customer base (requires engaging many customers to meet distribution need)
	Distribution topology (number of customers)	Projects that solve substation needs → provides a larger number of customers to potentially enroll in DER programs	Projects that solve specific circuit needs → provides a smaller number of customers to potentially enroll in DER programs

*Not Accepted*





# Proposed NWA Identification & Sourcing Process



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# T&D Non-Wires Alternative Definition *(updated)*

## **NWA Definition:**

*An electricity grid project that uses non-traditional transmission and distribution (T&D) solutions, such as distributed generation (DG), energy storage, energy efficiency (EE), demand response (DR), and grid software and controls, to defer or avoid the need for conventional transmission and/or distribution infrastructure investments.*

Sources: Adapted from Navigant, DOE and E4TheFuture, PLMA & SEPA, Non-wires Alternatives: Case Studies from Leading US Projects



# Distribution Service Definitions *(updated)*

## **Distribution Capacity Service:**

*A supply and/or a load modifying service that DERs provide as required via the dispatch of power output for generators and electric storage, and/or reduction in load that is capable of reliably and consistently reducing net loading on desired distribution infrastructure. Distribution Capacity service can be provided by a single DER resource and/or an aggregated set of DER resources that reduce the net loading on a specific distribution infrastructure location coincident with the identified operational need in response to a control signal from the utility.*

## **Reliability (Back-Tie) Service:**

*A supply and/or load modifying service capable of improving local distribution reliability under abnormal conditions. Specifically, this service reduces contingent loading of grid infrastructure to enable operational flexibility to safely and reliably reconfigure the distribution system to restore customers.*

Source: Adapted with HI stakeholder feedback on references from California PUC IDER & DRP Dockets



# T&D Grid Projects Identification

- ◆ Two planning processes identify grid needs and potential related wires solutions
  - ◆ Annual:
    - ◆ Identification of near-term asset management projects
    - ◆ T&D planning analysis of near-term grid needs based on planning criteria
  - ◆ Bi-annual longer-term IGP resource & growth driven needs
- ◆ Commission directed NWA evaluation of all T&D opportunities, near-term (annual planning) and long-term (bi-annual IGP)
- ◆ Requires modification of IGP process and more fully incorporate alternative sourcing methods (Pricing, Programs & Procurement) to address range of NWA opportunities

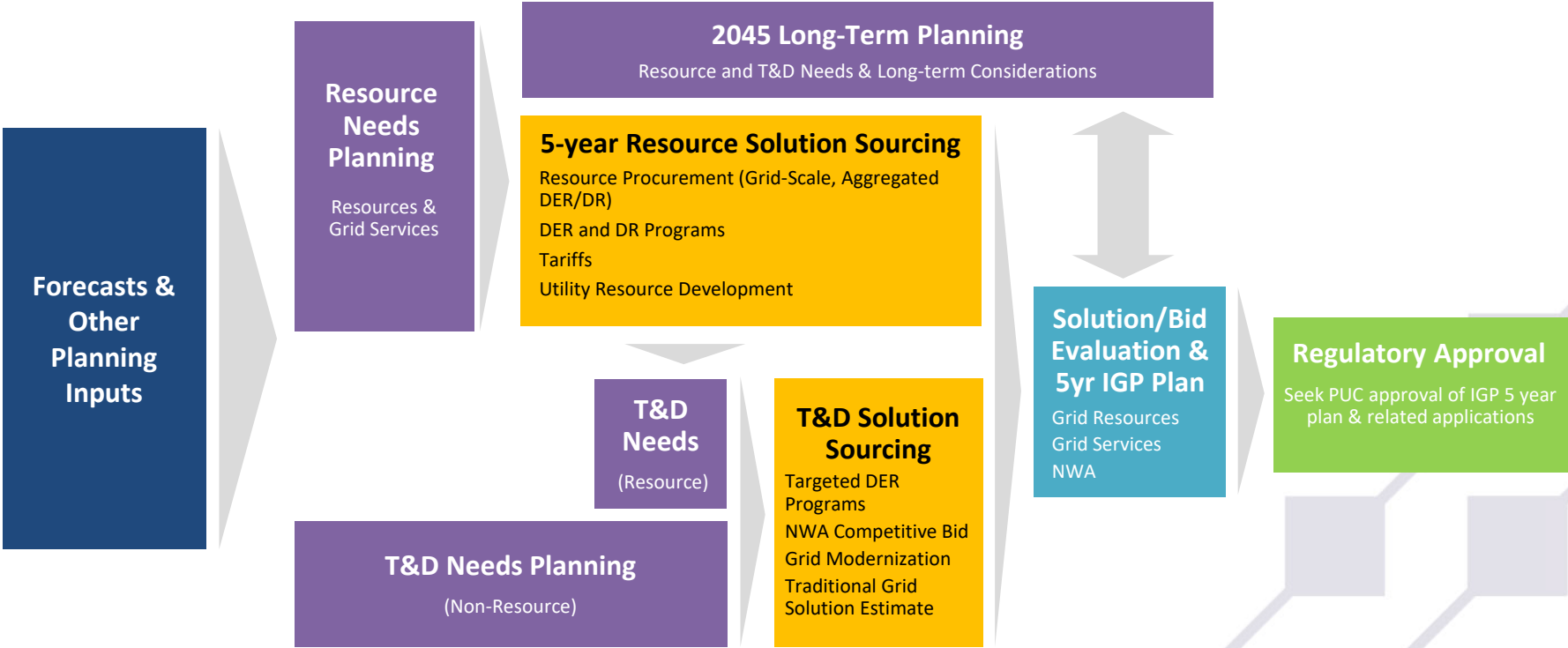


# T&D NWA Identification Process

- ◆ Process needs to identify prioritized NWA opportunities for:
  - ◆ Large, longer-term projects
  - ◆ Smaller, shorter-term projects
- ◆ Process needs to support both IGP and annual distribution planning cycles
- ◆ Process needs to enable sourcing through 3Ps to expand market opportunity for NWA and address the timing and scale of various grid needs
  - ◆ DER services tariff for small, short-term projects
  - ◆ Programs for small, short-term projects & unique situations (e.g., new housing developments)
  - ◆ Procurements for larger, longer-term projects

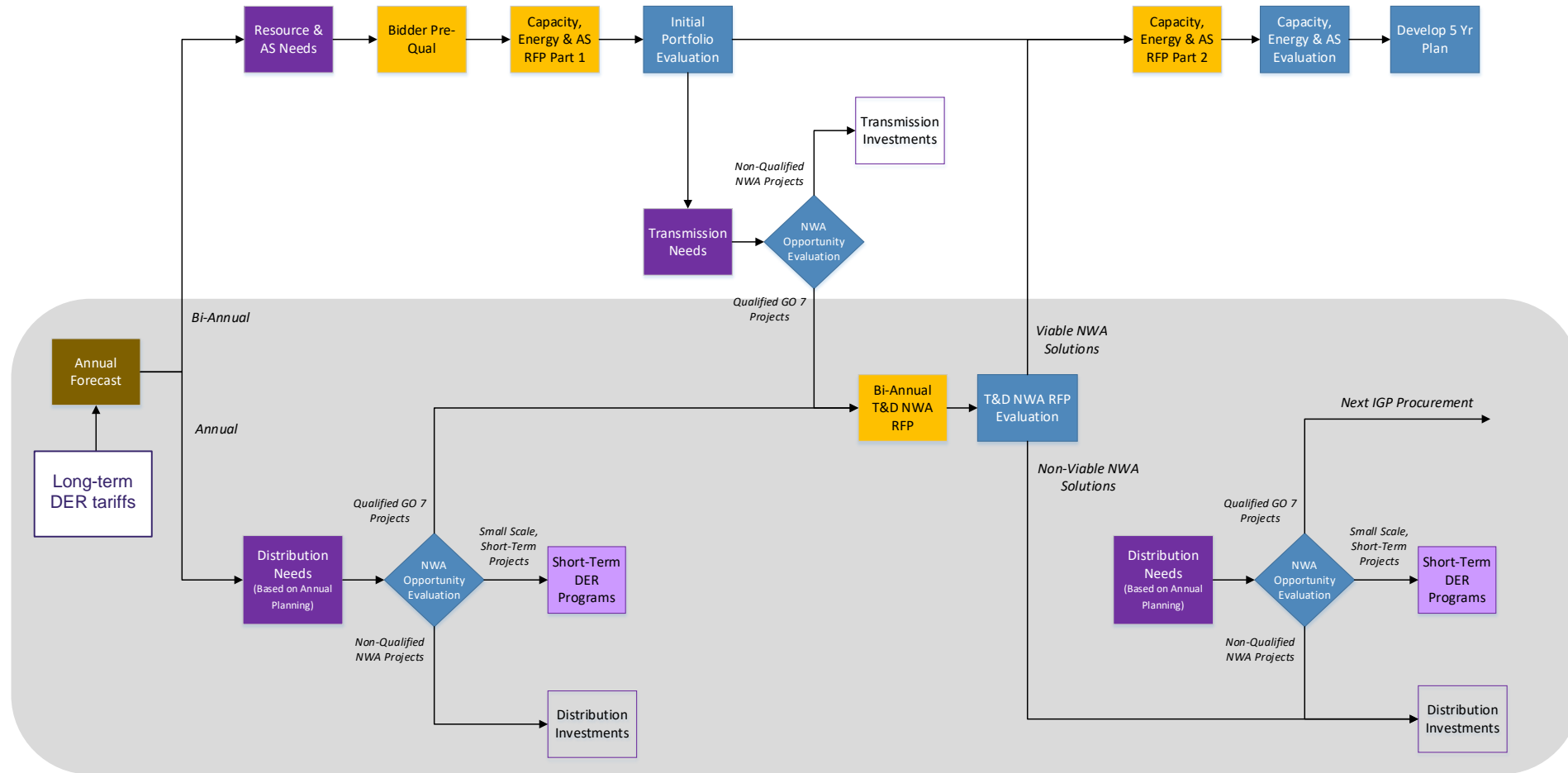


# IGP Overview

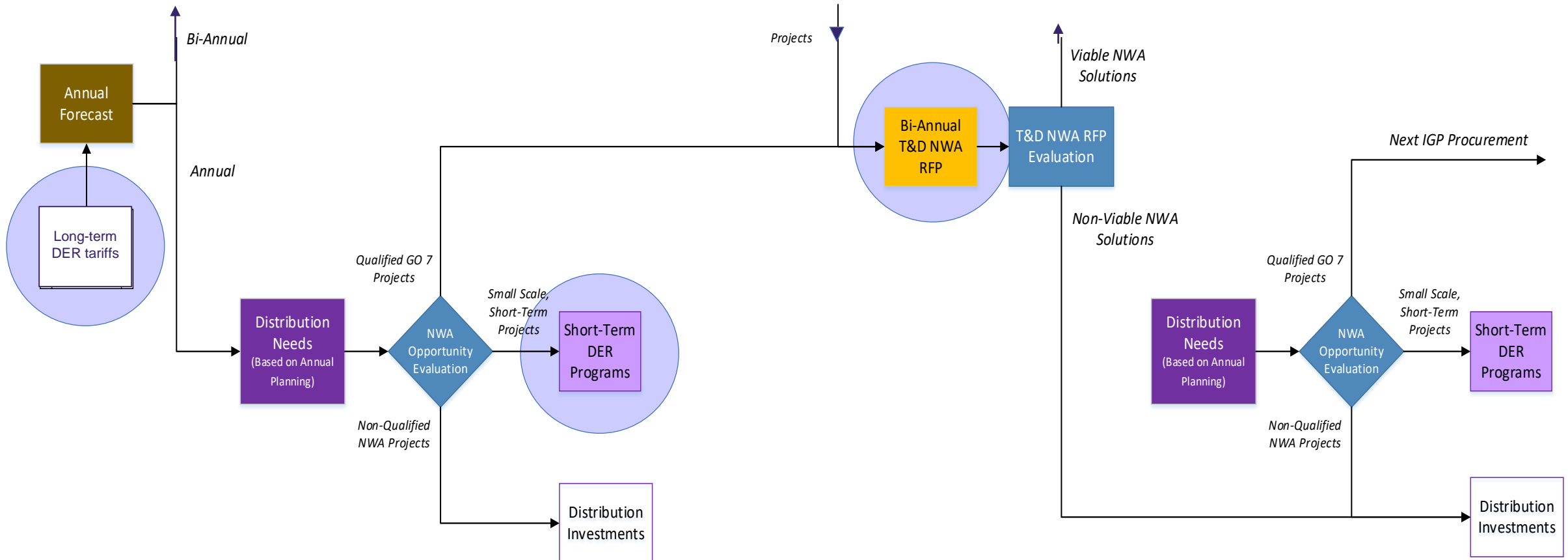


# Revised IGP Sourcing with 3P's Approach Integrated

(Annual Distribution Planning & NWA Qualification Evaluation w/Bi-annual NWA RFP for Lg. Projects)



# Annual Distribution Planning & NWA Qualification Evaluation with Bi-Annual IGP NWA RFP for Larger Scale Opportunities





# Proposed NWA Opportunity Evaluation Criteria



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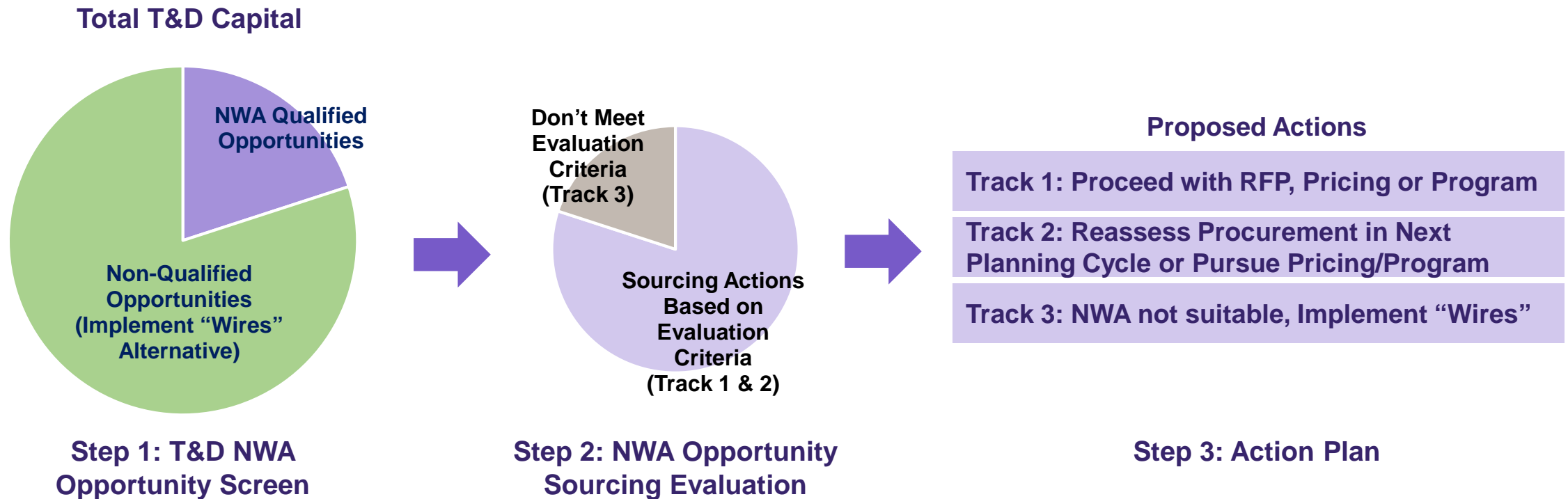
# T&D NWA Opportunity Evaluation

- ◆ **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:

- ◆ Necessary to provide connection in response to customer service and/or resource interconnection requests
  - ◆ Requests involving providing new physical connection to the electric grid
  - ◆ DER is not substitute for requested physical grid connections
- ◆ Necessary to address maintenance, asset condition or safety needs
  - ◆ Projects involving preventative replacement to avoid outages, catastrophic failures and ensure public safety
  - ◆ 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	\$25k/yr Avoided Cost
3	Project C	24x7 Load Reduction	Jan 2023-Dec 2027	High	Low	\$1mm/yr Avoided Cost



# Case Examples

## ◆ East Kapolei - Reliability Back-tie

- ◆ New housing and commercial developments expected over the next 3-5 years in East Kapolei that will cause contingency (N-1) overloads. The need is peak load reductions between 4pm – 10pm.

## ◆ Hoopili - Distribution Capacity Deferral

- ◆ New development with significant load increases over a 20-year horizon. Over the next 5-7 years forecasted capacity needs equivalent to 4 new substation transformer units. The distribution need can be 10+ hours in some cases. Due to uncertainty of 2025 forecast, need should be re-assessed as residential community develops, potential opportunity for locational pricing or programmatic options leading up to 2025 need.

Track	Grid Need	Performance Requirements	Timing	Forecast Certainty	Market Assessment	Economic Assessment
1	East Kapolei – Reliability Back-tie	4-6hr/6 days Peak Load Reduction	Jan 2023- Dec 2027	High	Medium	\$600k/yr Avoided Cost
3	Hoopili Tsf 1 & 2 – Distribution Capacity Deferral	10+hr x 7d Load Reduction	Jan 2022- Dec 2024	Medium	Low	\$1.2M/yr Avoided Cost
2	Hoopili Tsf 3 & 4 – Distribution Capacity Deferral	10+hr x 7d Load Reduction	Jan 2025- Dec 2029	Low	Medium	\$350k/yr Avoided Cost



# Next Steps

## ◆ Next meeting:

- ◆ Date: Thurs., Aug 8<sup>th</sup> , Time TBD
- ◆ Location: ASB 2, 1001 Bishop St., 8<sup>th</sup> Floor
- ◆ Topic: Stakeholder Feedback on Proposed Distribution & IGP Process Integration, and NWA Opportunity Evaluation Method
  - ◆ Stakeholder presentations welcome and open discussion
- ◆ 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))

