

# IGP Stakeholder Council Meeting

August 23, 2019



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

# Agenda

TIME	ITEM
8:30 – 8:40	Welcome and order of the day
8:45 – 9:00	HAVEN overview and Soft Launch Description overview
9:00 – 9:20	Groups split between HAVEN and Soft Launch
9:20 – 9:25	Break
9:25 – 9:45	Groups split between HAVEN and Soft Launch
9:45 – 10:00	Announcements and BREAK
10:00 – 10:05	Introduction of Presentation Topic
10:05 – 11:05	TOPIC PRESENTATION: Updated Resource Plans
11:05 – 11:30	Q&A; Discussion
11:30 – 11:40	Break
11:40 – 12:00	Summary of July 31, 2019 IGP Filing
12:00 – 12:15	Q&A; Discussion
12:15 – 12:30	Next steps and final announcements



# Collaboration App: PopInNow

Engagement tool for the stakeholder feedback

- ◆ During the second half of the session, questions will be posed and your answers will be recorded via POPin!



# HAVEN Overview



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Maui Electric  
Hawai'i Electric Light

# HAVEN

- ◆ The Hawaii Advanced Visualization Energy Nexus (HAVEN) is a collaboration between the Department of Business, Economic Development, and Tourism (DBEDT), the Hawaiian Electric Companies, and the University of Hawaii Laboratory for Advanced Visualization and Applications (LAVA)
- ◆ HAVEN translates the Companies' 2016 Power Supply Improvement Plans into a visual projection that illustrates the pathways that Hawaiian Electric can take to achieve the goal of 100% renewable by 2045
- ◆ By developing the technology and proving the concept, HAVEN can be used to provide similar visualizations for IGP plans

[Link to HAVEN video](#)



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# Soft Launch NWA Overview



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# Soft Launch NWA RFP

## Purpose:

- ◆ A soft launch of the sourcing process will help inform development of the full scale IGP planning and sourcing effort beginning in 2020.

## Objectives:

- ◆ IGP Soft Launch is intended to demonstrate the sourcing processes and evaluation methods for distribution non-wires alternatives in 2019.
- ◆ A Soft Launch project will provide real-world experience associated with the identification of needs for a resource choice like aggregated DER because of locational impacts of DER.
- ◆ This process will also work to address concerns with transparency and access to information among the working groups.
- ◆ Soft Launch is focused on one distribution substation capacity deferral need that can be reasonably addressed by NWA.
- ◆ Soft Launch will commence with sourcing and evaluation in 2019 and continue with anticipated solution deployment in 2020-21 and operational testing by 2022.



# Updated Resource Plans



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# 2016 Power Supply Improvement Plans

- ◆ The Power Supply Improvement Plan Update Report: December 2016 (“PSIP”) provided long range resource plans and specific Near-Term Action Plans for each of the islands in the Companies’ service territory
- ◆ These plans identified the amount and timing of potential resources to be acquired and were used to inform the procurement targets in the Companies’ RFPs
- ◆ These plans provide an important framework of resources in the multiple long-range plans to determine the roles and value of various resource additions, including projects bid into RFPs
- ◆ The PSIP plans have been updated for multiple changes that have occurred since 2017 and the many assumptions in the 2016 PSIP

See Docket No. 2014-0183, Chapter 7 of The Hawaiian Electric Companies’ Power Supply Improvement Plan Update Report, filed December 23, 2016 and accepted by the Commission in Decision and Order No. (“D&O”) 34696, filed July 14, 2017.



# Stage 1 RFP for Variable Renewable Dispatchable Generation

- ◆ On Oahu, the PSIP identified 180 MW of grid-scale PV in 2020 and 40 MW of grid-scale PV in 2022
- ◆ On Hawaii Island, the PSIP identified 20 MW of grid-scale wind in 2020 and 50 MW of grid-scale wind in 2022
- ◆ On Maui, the PSIP identified 60 MW of grid-scale wind in 2020
- ◆ The energy provided by these resources in the PSIP was used to inform the annual energy target in the RFP
- ◆ The RFP was purposefully “technology agnostic” to avoid market constraints

Additional details on the Stage 1 RFP can be found in the Archived RFP Information here: <https://www.hawaiianelectric.com/clean-energy-hawaii/selling-power-to-the-utility/competitive-bidding-for-new-generation/competitive-bidding-archived-rfp-information>



# Stage 1 RFP for Variable Renewable Dispatchable Generation

- ◆ Applications for six grid-scale solar-plus-battery storage projects solicited in the Stage 1 RFP were approved by the PUC in March 2019
  - ◆ On Oahu: 3 projects totaling 127 MW with 508 MWh of storage
  - ◆ On Hawaii Island: 2 projects totaling 60 MW with 240 MWh of storage
  - ◆ On Maui: 1 project at 60 MW with 240 MWh of storage
- ◆ Two grid-scale solar-plus-battery storage projects are still under PUC review
  - ◆ On Oahu: 1 project at 12.5 MW with 50 MWh of storage
  - ◆ On Maui: 1 project at 15 MW with 60 MWh of storage

See Hawaiian Electric's press release for additional details on the six approved projects from the Stage 1 RFP

<https://www.hawaiianelectric.com/six-low-priced-solar-plus-storage-projects-approved-for-oahu-maui-and-hawaii-islands>



# Stage 2 RFP for Variable Renewable Dispatchable Generation and Energy Storage

- ◆ The original intent of the Stage 2 RFP was to procure the remaining MWh that were not acquired in the Stage 1 RFP
- ◆ Based on Commission feedback, the Stage 2 RFP scope was expanded to:
  - ◆ Further accelerate the resources identified in the PSIP
  - ◆ Provide replacement energy and capacity needed due to the expiration of the AES PPA on Oahu and retirement of Kahului Power Plant on Maui
  - ◆ Provide “contingency options” if Puna Geothermal Venture power plant and Hu Honua power plant do not come online
  - ◆ Address resource needs identified in the PSIP on Molokai and Lanai



# Updates to the Companies' Resource Plans

- ◆ The Companies have made updates to the resource plans filed in the 2016 PSIP to:
  - ◆ Reflect the contracting of Hu Honua
  - ◆ Reflect the filed and approved projects from the Stage 1 RFP
  - ◆ Incorporate the latest capacity and energy targets from the Stage 2 RFP
  - ◆ Reflecting changes in other projects assumed as near term additions in the PSIP



# Resource Plan Updates for Oahu

Year	1. 2016 PSIP Plan for Oahu	2. Add projects filed in Stage 1 RFP	3. Remove and replace PSIP projects with Stage 2 RFP targets	4. Add projects that have revised timing
2019	Install 20 MW West Loch PV Project	Install 20 MW West Loch PV Project	Install 20 MW West Loch PV Project	Install 20 MW West Loch PV Project
	Install 70 MW Contingency Battery	Install 70 MW Contingency Battery	<del>Install 70 MW Contingency Battery</del>	<b>Install 109.6 MW Clearway PV Projects</b>
2020	Install 180 MW Grid-Scale PV	Install 180 MW Grid-Scale PV	<del>Install 180 MW Grid-Scale PV</del>	<b>Install 5 MW CBRE PV (Phase 1)</b>
				<b>Install 24 MW Na Pua Makani Wind Project</b>
2021		<b>Install West Oahu Solar – 12.5 MW PV + 50 MWH Storage</b>	Install West Oahu Solar – 12.5 MW PV + 50 MWH Storage	Install West Oahu Solar – 12.5 MW PV + 50 MWH Storage
	Convert H8 & H9 to Synchronous Condenser	Convert H8 & H9 to Synchronous Condenser	Convert H8 & H9 to Synchronous Condenser	
2022	AES deactivated	AES deactivated	AES deactivated	AES deactivated
	Install 40 MW of Grid-Scale PV	Install 40 MW of Grid-Scale PV	<del>Install 40 MW of Grid-Scale PV</del>	<b>Install 43.5 MW CBRE PV (Phase 2)</b>
	Install 426 MW 4-hour Load-Shift Battery	Install 426 MW 4-hour Load-Shift Battery	<del>Install 426 MW 4-hour Load-Shift Battery</del>	<b>Install synchronous condensers and/or other technologies to enable reliable operation of resource portfolio</b>
	Install 100 MW JBPHH Plant	Install 100 MW JBPHH Plant	<del>Install 100 MW JBPHH Plant</del>	
		<b>Install Hoohana Solar 1 – 52 MW PV + 208 MWH Storage</b>	Install Hoohana Solar 1 – 52 MW PV + 208 MWH Storage	Install Hoohana Solar 1 – 52 MW PV + 208 MWH Storage
		<b>Install Mililani 1 Solar – 39 MW PV + 156 MWH Storage</b>	Install Mililani 1 Solar – 39 MW PV + 156 MWH Storage	Install Mililani 1 Solar – 39 MW PV + 156 MWH Storage
		<b>Install Waiawa Solar – 36 MW PV + 144 MWH Storage</b>	Install Waiawa Solar – 36 MW PV + 144 MWH Storage	Install Waiawa Solar – 36 MW PV + 144 MWH Storage
			<b>Install Stage 2 RFP Projects (1,300 GWH Annual Renewable Energy)</b>	Install Stage 2 RFP Projects (1,300 GWH Annual Renewable Energy)
			<b>Install Stage 2 Grid-Charged Energy Storage (200 MW, 6-hour, 438 GWH annually)</b>	Install Stage 2 Grid-Charged Energy Storage (200 MW, 1,200 MWh daily)
		<b>Install Demand Response Programs from Grid Services RFP (Up to 119 MW)</b>	Install Demand Response Programs from Grid Services RFP (Up to 119 MW)	
2023	Waiiau 3 & Waiiau 4 Removal from Service	Waiiau 3 & Waiiau 4 Removal from Service	Waiiau 3 & Waiiau 4 Removal from Service	Waiiau 3 & Waiiau 4 Removal from Service
	Install 54 MW KMCBH Plant	Install 54 MW KMCBH Plant	<del>Install 54 MW KMCBH Plant</del>	<b>Install 47 MW Palehua Wind Project</b>
2024				



# Oahu

Year	2016 PSIP Plan for Oahu (E3 Gen Mod Plan)	Updated Resource Plan for Oahu
2019	Install 20 MW West Loch PV Project	Install 20 MW West Loch PV Project
	Install 70 MW Contingency Battery	Install 109.6 MW Clearway PV Projects
2020	Install 180 MW Grid-Scale PV	Install 5 MW CBRE PV (Phase 1)
		Install 24 MW Na Pua Makani Wind Project
2021	Convert H8 & H9 to Synchronous Condenser	Install West Oahu Solar – 12.5 MW PV + 50 MWH Storage
2022	AES deactivated	AES deactivated
	Install 40 MW of Grid-Scale PV	Install 43.5 MW CBRE PV (Phase 2)
	Install 426 MW 4-hour Load-Shift Battery	Install Hoohana Solar 1 – 52 MW PV + 208 MWH Storage
	Install 100 MW JBPHH Plant	Install Mililani 1 Solar – 39 MW PV + 156 MWH Storage
		Install Waiawa Solar – 36 MW PV + 144 MWH Storage
		Install Stage 2 RFP Projects (1,300 GWH Annual Renewable Energy)
		Install Stage 2 Grid-Charged Energy Storage (200 MW, 1,200 MWh daily)
		Install Demand Response Programs from Grid Services RFP (Up to 119 MW)
2023	Waiau 3 & Waiau 4 Removal from Service	Waiau 3 & Waiau 4 Removal from Service
	Install 54 MW KMCBH Plant	Install 47 MW Palehua Wind Project
2024		



# Oahu

Year	2016 PSIP Plan for Oahu (E3 Gen Mod Plan)	Updated Resource Plan for Oahu
2025	Install 200 MW of Offshore Wind	Install 200 MW of Offshore Wind
	Install 200 MW of Grid-Scale PV	
	Install 29 MW 4-hour Load-Shift Battery	
2026	Install 151 MW CC	Install 151 MW CC
	Waiau 5 & 6 Removal From Service	Waiau 5 & 6 Removal From Service
2028	Install 151 MW CC	Install 151 MW CC
	Kahe 5 & 6 Removal From Service	Kahe 5 & 6 Removal From Service
2030	Install 165 MW 4-hour Load-Shift Battery	Install 165 MW 4-hour Load-Shift Battery
2031	Waiau 7 & 8 Removal From Service	Waiau 7 & 8 Removal From Service
2032	Install 302 MW CC (2 x 151 MW)	Install 302 MW CC (2 x 151 MW)
2035	Install 168 MW 4-hour Load-Shift Battery	Install 168 MW 4-hour Load-Shift Battery
	Kahe 1 & 2 Removal From Service	Kahe 1 & 2 Removal From Service
2039	Kahe 3 & 4 Removal From Service	Kahe 3 & 4 Removal From Service
2040	Install 280 MW of Grid-Scale PV	Install 280 MW of Grid-Scale PV
	Install 420 MW 4-hour Load-Shift Battery	Install 420 MW 4-hour Load-Shift Battery
2045	Install 1180 MW of Grid-Scale PV	Install 1180 MW of Grid-Scale PV
	Install 1525 MW 4-hour Load-Shift Battery	Install 1525 MW 4-hour Load-Shift Battery
	Install 68 MW ICE (4 x 17 MW)	Install 68 MW ICE (4 x 17 MW)
	Install 30 MW Wind	
	CIP CT-1, Waiau 9 & 10, Airport DSG, Schofield, 154 MW Military Generation biodiesel conversion KPLP biodiesel conversion	CIP CT-1, Waiau 9 & 10, Airport DSG, Schofield, 154 MW Military Generation biodiesel conversion KPLP biodiesel conversion





# Resource Plan Updates for Hawaii Island

Year	1. 2016 PSIP Plan for Hawai'i Island	2. Revise PSIP Plan for Hu Honua	3. Add projects filed in Stage 1 RFP	4. Remove and replace PSIP projects with Stage 2 RFP targets	5. Add projects that have revised timing
2019					
2020	Install 25 MVA Synchronous Condensers				<b>PGV resumes service</b>
		<b>Install 22 MW Hu Honua Biomass</b>	Install 22 MW Hu Honua Biomass	Install 22 MW Hu Honua Biomass	Install 22 MW Hu Honua Biomass
	Install 12 MW 4-hour Load-Shift Battery	<b>Install 20 MW of Wind paired with 4-hour Storage</b>	Install 20 MW of Wind paired with 4-hour Storage	<del>Install 20 MW of Wind paired with 4-hour Storage</del>	<b>Install 1 MW CBRE PV (Phase 1)</b>
	Install 20 MW Wind	<b>Install 30 MW of Wind</b>	Install 30 MW of Wind	<del>Install 30 MW of Wind</del>	
	Install 9 MW Contingency Battery	Install 9 MW Contingency Battery	Install 9 MW Contingency Battery	<del>Install 9 MW Contingency Battery</del>	
	Puna Steam, Hill 5&6 Removal From Service				
2021					
2022	Install 50 MW Wind				
			<b>Install Hale Kuawehi - 30 MW PV + 120 MWH Storage</b>	Install Hale Kuawehi - 30 MW PV + 120 MWH Storage	Install Hale Kuawehi - 30 MW PV + 120 MWH Storage
			<b>Install Waikoloa Solar - 30 MW PV + 120 MWH Storage</b>	Install Waikoloa Solar - 30 MW PV + 120 MWH Storage	Install Waikoloa Solar - 30 MW PV + 120 MWH Storage
				<b>Install 9.5 MW CBRE PV (Phase 2)</b>	
2023				<b>Install Stage 2 RFP Projects (up to 444 GWH Annual Renewable Energy)</b>	Install Stage 2 RFP Projects (up to 444 GWH Annual Renewable Energy)
				<b>Install Demand Response Programs from Grid Services RFP (up to 4 MW total)</b>	Install Demand Response Programs from Grid Services RFP (up to 4 MW total)
					<b>Install synchronous condensers and/or other technologies to enable reliable operation of resource portfolio</b>
2024					



# Hawaii Island

Year	2016 PSIP Plan for Hawaii Island (E3 Plan)	2016 PSIP Plan for Hawaii Island with Hu Honua (E3 Plan)	Updated Resource Plan for Hawaii Island
2019			
2020	Install 20 MW Wind	Install 30 MW of Wind	
	Install 9 MW Contingency Battery	Install 9 MW Contingency Battery	Install 1 MW CBRE PV (Phase 1)
	Install 12 MW 4-hour Load-Shift Battery	Install 20 MW of Wind paired with Storage	PGV resumes service
	Install 25 MVA Synchronous Condensers	Install 22 MW Hu Honua	Install 22 MW Hu Honua
2021			
2022	Install 50 MW Wind		Install 9.5 MW CBRE PV (Phase 2)
			Install Hale Kuawehi - 30 MW PV + 120 MWH Storage
			Install Waikoloa Solar - 30 MW PV + 120 MWH Storage
2023			Install Stage 2 RFP Projects (up to 444,000 MWH Annual Renewable Energy)
			Install Demand Response Programs from Grid Services RFP (up to 4 MW total)
			Install synchronous condensers and/or other technologies to enable reliable operation of resource portfolio
2024			



# Hawaii Island

Year	2016 PSIP Plan for Hawaii Island (E3 Plan)	2016 PSIP Plan for Hawaii Island with Hu Honua (E3 Plan)	Updated Resource Plan for Hawaii Island
2025	Install 9 MW 4-hour Load-Shift Battery	Install 12 MW 4-hour Load Shift Battery	
2030	Install 39 MW 4-hour Load-Shift Battery	Install 26 MW 4-hour Load Shift Battery	
2035	Install 21 MW 4-hour Load-Shift Battery	Install 21 MW 4-hour Load Shift Battery	Install 8 MW 4-hour Load Shift Battery
2040	Install 48 MW 4-hour Load-Shift Battery	Install 49 MW 4-hour Load Shift Battery	Install 49 MW 4-hour Load Shift Battery
	CT1 biodiesel conversion		
	CT2 Removal From Service		
2045	Install 30 MW Wind	Install 10 MW of Wind	
	Install 74 MW 4-hour Load-Shift Battery	Install 82 MW 4-hour Load Shift Battery	Install 82 MW 4-hour Load-Shift Battery
	Keahole CC biodiesel conversion	Keahole CC biodiesel conversion	Keahole CC biodiesel conversion
	HEP biodiesel conversion	HEP biodiesel conversion	HEP biodiesel conversion
	CT3 biodiesel conversion	CT1, CT2, CT3 biodiesel conversion	CT1, CT2, CT3 biodiesel conversion
	Small diesels biodiesel conversion	Small diesels biodiesel conversion	Diesel to biodiesel conversion



# Resource Plan Updates for Maui

Year	1. 2016 PSIP Plan for Maui	2. Add projects filed in Stage 1 RFP	3. Remove and replace PSIP projects with Stage 2 RFP targets	4. Add projects that have revised timing
2019	Install 9 MW Contingency Battery	Install 9 MW Contingency Battery	Install 9 MW Contingency Battery	
2020	Install 60 MW Wind	Install 60 MW Wind	<del>Install 60 MW Wind</del>	
	Install 30 MVA Synchronous Condensers	Install 30 MVA Synchronous Condensers	Install 30 MVA Synchronous Condensers	Install 1 MW CBRE PV (Phase 1)
2021				
2022	Install 40 MW Biomass	Install 40 MW Biomass	<del>Install 40 MW Biomass</del>	
	Install Two 9 MW NTA ICE	Install Two 9 MW NTA ICE	<del>Install Two 9 MW NTA ICE</del>	
		Install Kuihelani Solar - 60 MW PV + 240 MWH Storage	Install Kuihelani Solar - 60 MW PV + 240 MWH Storage	Install Kuihelani Solar - 60 MW PV + 240 MWH Storage
		Install Paeahu - 15 MW PV + 60 MWH Storage	Install Paeahu - 15 MW PV + 60 MWH Storage	Install Paeahu - 15 MW PV + 60 MWH Storage
			Install Stage 2 RFP Projects (295,000 MWH Annual Renewable Energy)	Install Stage 2 RFP Projects (295,000 MWH Annual Renewable Energy)
			Install Stage 2 Energy Storage (40 MW, 58 GWH annually)	Install Stage 2 Energy Storage (40 MW, 58 GWH annually)
			Install Demand Response Programs from Grid Services RFP (up to 21 MW total)	Install Demand Response Programs from Grid Services RFP (up to 21 MW total)
			Install synchronous condensers and/or other technologies to enable reliable operation of resource portfolio	
2023				Install 9.5 MW CBRE PV (Phase 2)
2024	33 MW Kahului Planned Retirement	33 MW Kahului Planned Retirement		33 MW Kahului Planned Retirement



# Maui

Year	2016 PSIP Plan for Maui (E3 Plan)	Updated Resource Plan for Maui
2019	Install 9 MW Contingency Battery	
2020	Install 60 MW Wind	Install 1 MW CBRE PV (Phase 1)
	Install 30 MVA Synchronous Condensers	
2021		
2022	Install 40 MW Biomass	Install Kuihelani Solar - 60 MW PV + 240 MWH Storage
	Install Two 9 MW NTA ICE	Install Paeahu - 15 MW PV + 60 MWH Storage
		Install Stage 2 RFP Projects (295,000 MWH Annual Renewable Energy)
		Install Stage 2 Energy Storage (40 MW, 58,000 MWH annually)
		Install Demand Response Programs from Grid Services RFP (up to 21 MW total)
		Install 9.5 MW CBRE PV (Phase 2)
2023		Install synchronous condensers and/or other technologies to enable reliable operation of resource portfolio
2023		33 MW Kahului Planned Retirement
2024	33 MW Kahului Planned Retirement	



# Maui

Year	2016 PSIP Plan for Maui (E3 Plan)	Updated Resource Plan for Maui
2025	Install 4 MW 4-hour Load-Shift Battery	
2030	Install 28 MW 4-hour Load-Shift Battery	
2035	Install 18 MW 4-hour Load-Shift Battery	
2040	Install 52 MW 4-hour Load-Shift Battery	Install 27 MW 4-hour Load-Shift Battery
	Install 40 MW Geothermal	Install 40 MW Geothermal
2045	Install 70 MW Grid-Scale PV	Install 70 MW Grid-Scale PV
	Install 149 MW 4-hour Load-Shift Battery	Install 149 MW 4-hour Load-Shift Battery
	Ma'alaea 4–9 Removal From Service	Ma'alaea 4–9 Removal From Service
	Ma'alaea 10–13 Removal From Service	Ma'alaea 10–13 Removal From Service
	Ma'alaea X1–3 biodiesel conversion	Ma'alaea X1–3 biodiesel conversion
	106 MW Ma'alaea CC biodiesel conversion	106 MW Ma'alaea CC biodiesel conversion
	Two 9 MW NTA ICE biodiesel conversion	



# Resource Plan Updates for Molokai

Year	1. 2016 PSIP Plan for Molokai	2. Add projects filed in Stage 1 RFP	3. Remove and replace PSIP projects with Stage 2 RFP targets	4. Add projects that have revised timing
2019	Install 2.75 MW Contingency Battery		Install 2.75 MW Contingency Battery	
	Install 2.75 MVA Synchronous Condensers		Install 2.75 MVA Synchronous Condensers	
2020	Install 5 MW Wind		<del>Install 5 MW Wind</del>	
2021				Install 0.5 MW CBRE PV (Phase 1)
2022				Install 2.7 MW MNEP
				Install 0.75 MW CBRE PV (Phase 2)
2023			Install Stage 2 RFP Projects (8,500 MWH Annual Renewable Energy)	Install Stage 2 RFP Projects (8,500 MWH Annual Renewable Energy)
				Install synchronous condensers and/or other technologies to enable reliable operation of resource portfolio
2024				



# Molokai

Year	2016 PSIP Plan for Molokai (100% by 2030)	Updated Resource Plan for Molokai
2019	Install 2.75 MW Contingency Battery	
	Install 2.75 MVA Synchronous Condensers	
2020	Install 5 MW Wind	Install 0.5 MW CBRE PV (Phase 1)
2021		Install 2.7 MW MNEP
2022		Install 0.75 MW CBRE PV (Phase 2)
2023		Install Stage 2 RFP Projects (8,500 MWH Annual Renewable Energy)
		Install synchronous condensers and/or other technologies to enable reliable operation of resource portfolio
2025		
2030	Convert existing units to biodiesel	Convert existing units to biodiesel
2035		
2040		
2045		





# Resource Plan Updates for Lanai

Year	1. 2016 PSIP Plan for Lanai	2. Add projects filed in Stage 1 RFP	3. Remove and replace PSIP projects with Stage 2 RFP targets	4. Add projects that have revised timing
2019	Install 1.25 MW Contingency Battery		Install 1.25 MW Contingency Battery	
	Install 2.75 MVA Synchronous Condensers		Install 2.75 MVA Synchronous Condensers	
2020	Install 4 MW Wind		<b>Install 4 MW Wind</b>	
2021				<b>Install 0.5 MW CBRE PV (Phase 1)</b>
2022				<b>Install 0.75 MW CBRE PV (Phase 2)</b>
2023			<b>Install Stage 2 RFP Projects (up to 20,800 MWH Annual Renewable Energy)</b>	Install Stage 2 RFP Projects (up to 20,800 MWH Annual Renewable Energy)
				<b>Install synchronous condensers and/or other technologies to enable reliable operation of resource portfolio</b>
2024				



# Lanai

Year	2016 PSIP Plan for Lanai (100% by 2030)	Updated Resource Plan for Lanai
2019	Install 1.25 MW Contingency Battery	
	Install 2.75 MVA Synchronous Condensers	
2020	Install 4 MW Wind	Install 0.5 MW CBRE PV (Phase 1)
2021		
2022		Install 0.75 MW CBRE PV (Phase 2)
2023		Install Stage 2 RFP Projects (Up to 20,800 MWH Annual Renewable Energy)
		Install synchronous condensers and/or other technologies to enable reliable operation of resource portfolio
2025		
2030	Convert existing units to biodiesel	Convert existing units to biodiesel
2035		
2040		
2045		

# Renewable Portfolio Standard Achievement

- Assuming that the replacement capacity and energy for AES on Oahu and Kahului Power Plant on Maui is fulfilled in 2022 with the remaining Stage 2 energy targets procured by 2025, the renewable portfolio standard, measured as a percent of sales, is estimated to be:

RPS (% of Sales)	2022	2025
Oahu	48%	80%
Hawai'i Island	90%	100%
Maui	84%	110%
Moloka'i	59%	83%
Lana'i	16%	94%

← Includes 200 MW Offshore Wind in 2025

- If instead the Companies' renewable achievement were measured as a percent of generation, the renewable portfolio standard is estimated to be:

RPS (% of Generation)	2022	2025
Oahu	40%	64%
Hawai'i Island	71%	78%
Maui	63%	83%
Moloka'i	44%	62%
Lana'i	14%	84%

← Includes 200 MW Offshore Wind in 2025

# July 31, 2019 IGP Filing



Hawaiian Electric  
Maui Electric  
Hawai'i Electric Light

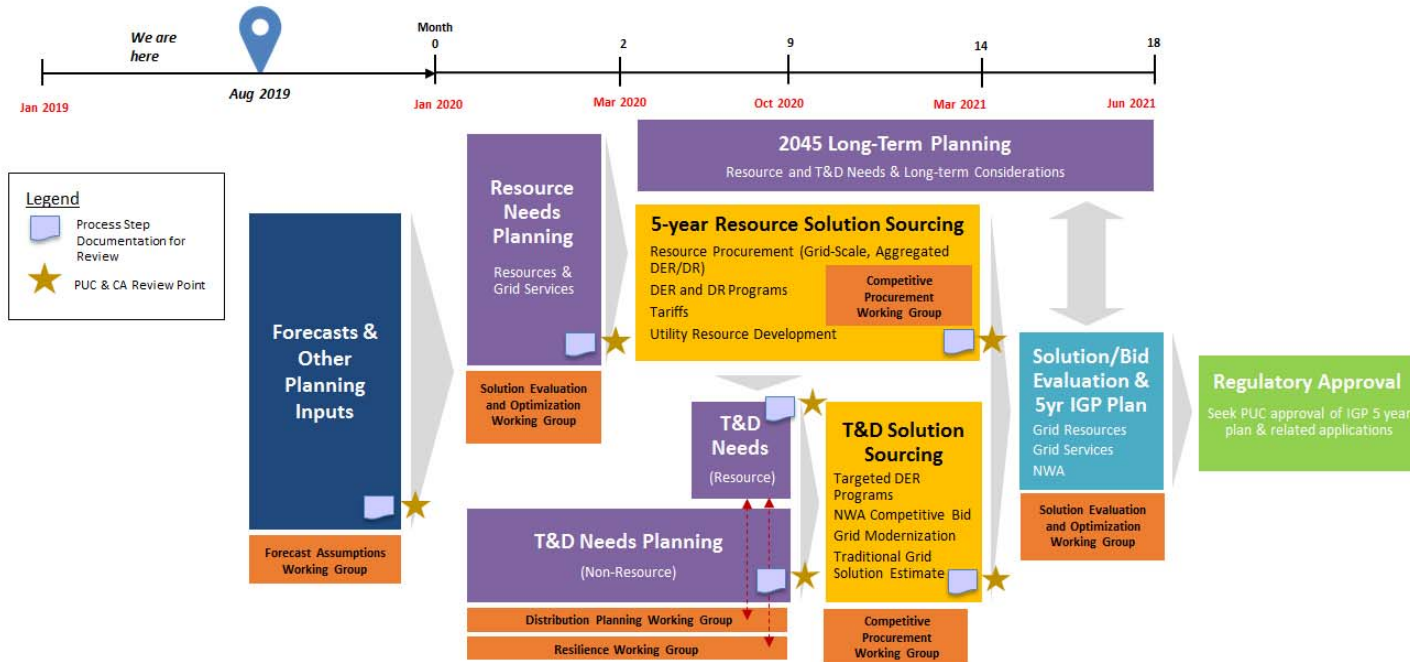
## July 31, 2019 Letter

- ◆ ...to provide additional details of the nature and scope of the review points that were identified in the IGP Workplan
- ◆ ...consider whether independent evaluation of these Review Points will aid the IGP process

Submitted by the Hawaiian Electric Companies in response to Order No. 36218, *Accepting the IGP Workplan and Providing Guidance* issued on March 14, 2019 in Docket No. 2018-0165.



# Review Points



# Vision for the Review Points

Document the assumptions, methodology, and results of each major process step

Shared with the TAP, Stakeholder Council, and Working Group to solicit their feedback

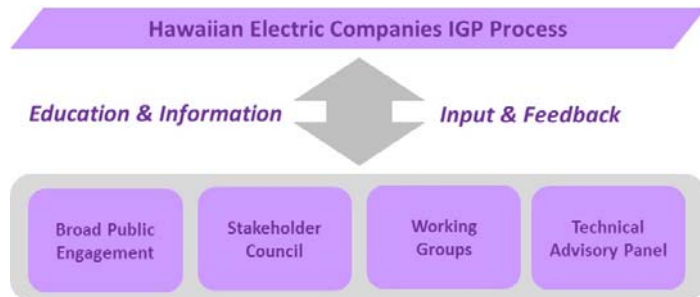
Incorporate comments received as an appendix

File the document in the IGP docket, and post it to the IGP website

Request that the Commission and Consumer Advocate provide comments within 30 days



# An Independent Observer Not Necessary

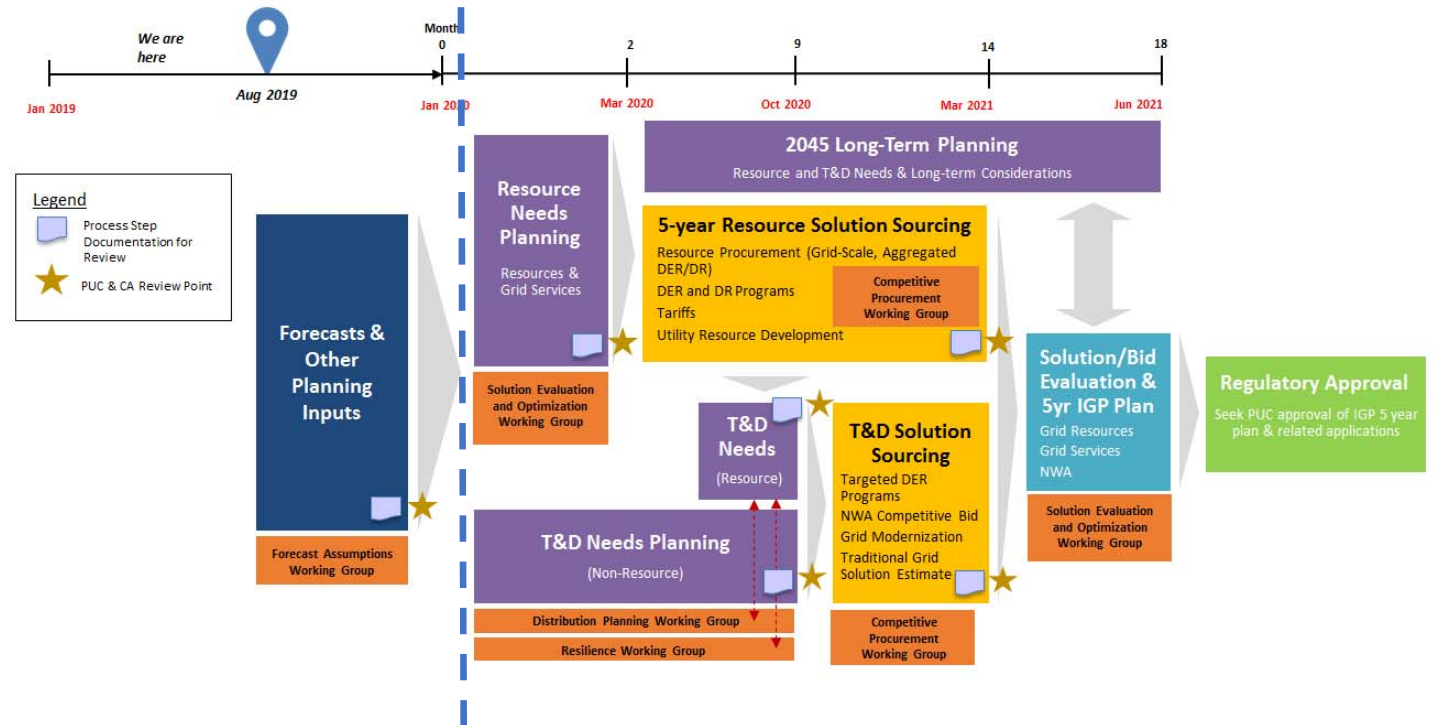


- ◆ Process utilizes an inclusive and transparent Stakeholder Engagement model
- ◆ Designed to solicit iterative and ongoing feedback from the Commission, Consumer Advocate, Stakeholder Council, Technical Advisory Panel (TAP), and working groups
- ◆ Access to the working group schedule and all meeting materials on the IGP website



# Alignment of IGP to the Stage 2 RFP

- ◆ Begin system needs assessment phase of the IGP upon determining the final award group in the Stage 2 RFP



# Next Steps and Final Announcements



Hawaiian Electric  
Maui Electric  
Hawai'i Electric Light

# Next Steps and Final Announcements

- ◆ Next meeting – Thursday, November 7<sup>th</sup>, 8:30am – 12n
- ◆ Follow-up questions or concerns regarding IGP?
  - ◆ Email: [IGP@hawaiianelectric.com](mailto:IGP@hawaiianelectric.com)
  - ◆ Colton Ching @ 543-7986



**Mahalo**



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Maui Electric  
Hawai'i Electric Light