

**Kamehameha Schools Motion for Modification, Time Extension, and Release and
Modification of Conditions, LUC Docket No. A87-610**

Written Direct Testimony of Nicholas Molinari, February 25, 2022

1. **Please state your name and business address for the record.**

My name is Nicholas Molinari. My business address is 282 Century Place, Suite 2000, Louisville, Colorado 80027.

2. **What is your current occupation?**

I am a Project Development Manager for The AES Corporation's solar energy and battery storage projects throughout the State of Hawai'i, including the Waiawa Phase 2 Solar project. The formal name of the development entity for this project is Waiawa Phase 2 Solar, LLC ("WP2S").

3. **Did you provide a copy of your resume for these proceedings?**

Yes, my resume was provided as Exhibit 16.

4. **Please briefly describe your educational background.**

I received a Bachelor of Science in Marketing from Saint Joseph's University.

5. **What do you do at WP2S?**

I lead a team responsible for the pre-construction development of the project, including design development and site studies and securing applicable land rights, permits, and governmental approvals to prepare the project for construction.

6. **What is the relationship between The AES Corporation and WP2S?**

WP2S is a wholly-owned indirect subsidiary of The AES Corporation. AES is a publicly-traded (NYSE: AES) Fortune 500 global energy company accelerating the future of energy. AES's revenues in 2020 were \$9.7 billion, and AES owns and manages \$34 billion in total assets.

AES regularly develops renewable energy projects through wholly owned subsidiaries, such as we are doing now. Under those arrangements, AES has three gigawatts of operating renewable projects across the United States, with another 2.6 gigawatts in the construction pipeline.

7. **What other projects has AES or its subsidiaries done in Hawai'i?**

We have several projects built or under construction in Hawai'i. The three operational projects are:

- Lawai on Kaua'i, a 20 megawatt ("MW") solar farm with battery energy storage system ("BESS").
- Kekaha on Kaua'i, a 14MW solar farm with BESS.

- Solar FIT on O‘ahu and Maui, 8.8MW of distributed solar farms.

The projects under construction and/or under contract for construction are:

- Waikoloa on Hawai‘i Island, a 30MW solar farm with BESS.
- West O‘ahu on O‘ahu, a 12.5MW solar farm with BESS.
- Kuihelani on Maui, a 60MW solar farm with BESS.
- Mountain View Solar on O‘ahu, a 7MW solar farm with BESS.
- West Kaua‘i Energy Project on Kauai, a 35MW solar farm and 24MW hydroelectric with BESS.

And of course, the solar farm project that is currently before the Land Use Commission for approval of Kamehameha Schools’ Motion for Modification, Time Extension, and Release and Modification of Conditions. Kamehameha Schools (“KS”) is the landowner and therefore the Successor Petitioner/Petitioner in that Motion.

8. **Please provide a description of that solar farm project.**

The solar farm that will be developed by WP2S is a 30 MW alternating current (AC)/60 MW direct current (DC) solar photovoltaic system, coupled with a 240 MW-hour BESS.

The solar photovoltaic system includes a series of solar modules mounted on single-axis trackers that rotate on a fixed axis from east to west as the sun moves across the sky. The battery energy storage system includes a series of battery units that will be housed in containers distributed throughout the site. The battery units will be installed on concrete pads (also referred to as “power conversion stations”), along with other equipment including inverters, transformers and communication equipment.

The project also includes a substation with control cabinets, step-up transformers, an operations and maintenance structure, and other ancillary interconnection equipment. Two 46 kV overhead lines will deliver power from the substation to the existing Waiau-Mililani and Wahiawa-Waimano 46 kV sub-transmission lines, which are generally parallel to the H-2 Freeway. The project components will be enclosed by fencing that will be about 7 feet high.

9. **How much power will this project generate?**

This project is one of the projects that will supply a new source of energy, which is badly needed due to the upcoming planned retirement of O‘ahu’s 180 MW coal plant. This project is anticipated to generate approximately 107,595 MW hours per year.

According to Hawaiian Electric Company, Inc. (“HECO”), this is enough energy to power the equivalent of approximately 18,000 homes a year.

10. **Has an interconnection study been done for this project?**

Yes. The interconnection study was completed in July 2021.

11. **What are the expected impacts of the project on greenhouse gas emissions?**

The net greenhouse gas (“GHG”) emissions reduction over the project lifecycle is 1,078,948 metric tons of GHG (MT CO₂e), based on a third-party analysis commissioned by HECO. When I refer to lifecycle, I mean everything, from start to finish. That figure takes into account emissions that occur during the upstream stage (emissions from raw material extraction, manufacturing, project construction, etc.), the operations stage, and the downstream stage (emissions from decommissioning and disposal of project materials). Over the course of 20 years, the net reduction in GHG emissions is 1,078,948 metric tons of GHG.

I also note that over the life of the PPA, the project is estimated to avoid fuel consumption to the tune of 2,908,097 barrels of fossil fuel, comprised of Low Sulfur Fuel Oil, Diesel Fuel, and Ultra-Low Sulfur Diesel.

12. **Has the Public Utilities Commission approved your PPA with HECO?**

Yes. In December of 2020 the Public Utilities Commission (“PUC”) approved our PPA with HECO.

13. **Where will the project be located?**

The project will be within approximately 387 acres in the northwestern portion of the Petition Area. When I use the term “Petition Area” I am referring to the 1,395-acre land area owned by KS that was put into the State Urban District by the State Land Use Commission under this Docket A87-610. The general location of the project is depicted on Exhibit 2.

It is one of the two areas that the Commission approved for solar development in 2014. The other area that the Commission approved for solar development is approximately 268 acres on the southeastern side of the Petition Area, which the Commission reauthorized for solar development by an Order issued in February 2020. That area is also depicted on Exhibit 2. I understand that SunEdison, the solar developer who originally intended to develop both of these areas that were approved by the Commission in 2014, was not able to move forward due to difficulties at the PUC and later went bankrupt.

Construction of the WP2S solar farm will be substantially complete within five years of the Commission’s issuance of an order approving KS’ pending Motion. In fact, our commercial operations date under the power purchase agreement (“PPA”) with HECO is

October 30, 2023, so this solar farm project is expected to be constructed well before five years from now.

14. **Why do Exhibits 2 and 13 show two different areas for this solar farm?**

There are two distinct project areas for this solar farm because one of the sites will be decommissioned 10 years earlier than the other site. Parcel A, which is about 151 acres, would be fully decommissioned no later than December 31, 2044. Parcel B, which is about 236 acres, would be fully decommissioned no later than December 31, 2054. The relationship of Parcel A and Parcel B to the overall Petition Area is shown in Exhibit 2. Exhibit 13 provides the conceptual layout of the project components within the two parcels.

The exact layout and configuration of these components will be refined through the final design and equipment procurement process. However, any refinements would not substantively increase the size or scope of the project, and the resulting layout would remain within the 387-acre footprint previously approved by the Commission in 2014. The final site layout and design details will be submitted to the City and County of Honolulu Department of Planning and Permitting for review and approval as part of the application for grading, grubbing and stockpiling and building permits.

15. **What is the term of the solar farm under the PPA?**

The initial term is 20 years starting from the commercial operations date. The commercial operations date is October 30, 2023.

16. **If the PPA term is only 20 years, why is KS requesting approval to December 31, 2044 for Parcel A, and December 31, 2054 for Parcel B?**

Solar panels have a design life of 35+ years. While the current PPA with HECO is for 20 years, the project would still have many years of operational value after 20 years. Therefore, we would like to continue generating this renewable energy longer than the 20-year PPA term, and plan on pursuing an extension to the PPA or a new PPA for Parcel B.

A longer term is not feasible for Parcel A because our land agreement with KS requires that site to be decommissioned by December 31, 2044. That is so that the solar project does not impede KS' development plans for the Petition Area. However, because Parcel B is further north and KS plans to develop that site later than the Parcel A site, our land agreement with KS allows the solar farm to remain on Parcel B for a longer period of time.

17. **Why not just return to the Commission before December 31, 2044 to request additional time for Parcel B?**

A requirement to return to the Commission in the future (i.e. 2043 or 2044) for approval for additional time poses significant risk of delay and additional cost and risk that might

threaten the viability of the project or result in a disruption of the delivery of power. Further, the land uses and impacts would not be affected by an extension of the current PPA for Parcel B or a new PPA for Parcel B as it would be just a continuation of operations.

I also note that the KS Motion proposes a condition for the Parcel B site to address the current 20-year PPA, as follows:

The interim use of Parcel B for the proposed solar farm, including any and all permitting, construction, operation, and decommissioning activities associated with the solar farm, shall not exceed December 31, 2054, without the prior written approval of the Commission; provided, however, that **in the event the solar farm project owner fails to secure a PUC-approved extension to the PPA, or a new PPA, within 12 months after the expiration of the current PPA, the project owner will immediately commence with the decommissioning of the solar farm on Parcel B and complete decommissioning within two years after the expiration of the current PPA.** (emphasis added).

18. **How is the timeline for this solar farm different from the solar farm that the Commission approved for this site in 2014?**
The project approved in 2014 was expected to be decommissioned by November of 2049. So, for the portion our project planned for Parcel A, we will decommission that faster than what the Commission already approved for this site in 2014. However, for the portion of our project planned for Parcel B, the decommissioning will be done 5 years later than what the Commission approved in 2014 for this property.
19. **The conceptual layout on Exhibit 13 shows a substation on Parcel A. Will that be removed when you decommission the portion of the project that is on Parcel A?**
Yes.
20. **How will Parcel B connect to the grid if the substation in Parcel A is decommissioned by the end of 2044?**
The project is designed to meet the power requirements for the current PPA with HECO. Prior to the expiration of the current PPA, WP2S will seek an extension of the PPA for Parcel B, or a new PPA for Parcel B. A new or extended PPA for Parcel B would take into account some area for a substation and interconnection facilities, and that would be factored into the Parcel B concept at that time.
21. **Please describe some of the more technical aspects of the solar farm.**
Solar Array. The solar photovoltaic array includes a series of solar modules mounted on single-axis trackers that rotate on a fixed axis from east to west as the sun moves across

the sky. The highest point of the panels will be approximately 15 feet above ground. They will be constructed in accordance with all building permit structural requirements, including the requirement to withstand hurricane-type winds.

Power Conversion Stations. The battery energy storage containers, as well as inverters, transformers, and other electrical and communications equipment, will be set on concrete pads (also referred to as “Power Conversion Stations”, or PCS pads) that are distributed throughout the solar array. The primary purpose of the equipment on each PCS pad is to collect and monitor the energy produced by the solar modules and convert the energy to a higher voltage alternating-current before routing it to a substation.

Substation. The project substation will be in the area generally depicted on Exhibit 13. There will be 46 kV steel structures to hold overhead conductors, foundations for equipment, circuit breakers, disconnect switches, fuse switches, lightning arrestors, generator step-up transformers, two outdoor steel or CMU control cabinets, and an operations and maintenance structure. As mentioned in response #8, all project components would be enclosed by a 7-foot-high fence. An additional fence will be installed around the substation area, in accordance with HECO requirements.

Battery Energy Storage System. The project includes a 240 MW-hour BESS, consisting of containerized lithium-ion battery units distributed throughout the solar arrays. The containerized units will be set on the concrete PCS pads. It is expected that each pad will contain two to four 45-foot (approx.) containers. Each container is a fully integrated system and incorporates multiple layers of protection to avoid failures and to contain potential hazardous substances. Specific features include integrated monitoring and circuit protection, a self-contained heating ventilation air cooling system, and a fire detection and suppression system specifically designed for lithium-ion battery energy storage systems. The fire detection and suppression system incorporates specific controls with automatic safety responses in response to conditions including high battery temperature, high air temperature, and the presence of smoke. The system also has emergency stop buttons that isolate the battery units from the solar arrays and electrical grid.

22. **Is the battery system safe?**

Yes. Each battery unit has multiple layers of protection to avoid failures and provide for containment. Specific features include integrated monitoring and circuit protection, a self-contained heating ventilation air cooling system, and a fire detection and clean agent suppression system specifically designed for lithium-ion BESS. The batteries will be stored in completely contained, leak-proof containers. Each battery container will have temperature/smoke/fire sensors, alarms, and aerosol fire extinguishing systems, and will be controlled by remote power disconnect switches. Additionally, each battery system will undergo qualification testing prior to commercial operation.

23. **What must be done to prepare the property for your solar farm?**

The property will require clearing, grubbing and grading to place the project components. In general, the project will minimize grading by avoiding steep areas to the extent possible and focus components to areas with gradual slopes. The design anticipates minimizing earthwork volumes and related disturbance by optimal placement of the PV racks following the existing grades and elevations to the extent practicable.

Access within the Petition Area is over existing roads where possible. New gravel access roads will be constructed within the project area to accommodate construction vehicles and to allow ongoing access for operations and maintenance. Prior to construction, temporary erosion and sediment control Best Management Practices (BMPs) will be implemented in accordance with State and City and County regulations. These items are further explained in the Preliminary Engineering Study that was filed as Exhibit 41.

24. **How many people are needed on site to construct the project?**

Up to 200 workers during the construction phase.

We estimate that the project overall, including development, construction, operations, and decommissioning, will generate some 565 jobs (accounting for direct, indirect, and induced jobs).

25. **How long with construction take?**

Construction is estimated to take between 12 to 18 months.

26. **How many people are needed on site for solar farm operations?**

The project is estimated to require approximately 4 full-time employees for operations and maintenance, including remote monitoring, preventative maintenance activities, and equipment servicing and troubleshooting.

27. **How long will decommissioning take?**

Decommissioning can take up to approximately one year. That estimate covers the scenario where we are decommissioning only the solar farm on Parcel A, or if we are decommissioning both Parcel A and Parcel B at the same time.

28. **What are WP2S's commitments to decommission the project?**

WP2S is committed to decommission the project within 12 months of the expiration of solar farm operations. That is a requirement under our agreement with KS. At the end of operations, and thus the start of the decommissioning period, WP2S shall, at its sole cost, remove all above-ground and below-ground structures from the property such as photovoltaic panels, transformers, substation infrastructure, energy storage facilities and foundations. Any materials then known to be harmful to the environment or health must be completely removed from the property in their entirety. Decommissioning shall also include all road reclamation, re-seeding and re-planting, as applicable and appropriate at

the time of decommissioning. The decommissioning will be in accordance with all laws and rules in effect at the time, including the Department of Health Hawaii Administrative Rules Chapter 11-273.1.

29. **What guarantees are in place to make sure that the decommissioning will be completed?**

Under our agreement with KS we must provide KS with decommissioning security in the amount of 100% of the estimated costs. That amount will be reassessed after the first 10 years of project operation then every 5 years thereafter, and WPS2 will update the security amount accordingly.

30. **If the Commission grants Kamehameha Schools' request, can you start construction immediately?**

No. The project will require a Conditional Use Permit (Minor), Grading, Grubbing and Stockpiling Permits, and Building Permits from the City and County of Honolulu Department of Planning and Permitting, as well as a National Pollutant Discharge Elimination System (NPDES) General Permit for Construction Activities, Notice of Intent from the State of Hawaii Department of Health.

31. **Are you going to be able to meet your contractual obligation to be in commercial operations by the end of October 2023?**

We would like to start construction during the first half of this year, ideally. We appreciate the Commission's consideration and action on the pending Motion so that WP2S can confidently move forward with securing the remaining permits and start construction as soon as possible in order to have the best chance of meeting the October 2023 commercial operations date.

32. **What public outreach did WP2S do for this project?**

WP2S has conducted and continues to conduct extensive public outreach to raise awareness and gather input about the project. WP2S began the outreach process with preliminary engagement with local officials, community leaders, and interested stakeholder organizations. Project representatives presented the project details at three of the four adjacent Neighborhood Boards (Mililani Mauka/Launani Valley Neighborhood Board #35, Pearl City Neighborhood Board #21, and Waipahu Neighborhood Board #22). Feedback received was largely positive. In fact, all three boards adopted resolutions in support of the WP2S project with near unanimous votes (only one abstention, no opposition). WP2S has been working to schedule a presentation to the Mililani-Waipio Neighborhood Board #25 but has not been placed on the agenda as of the time of this Motion. WP2S will continue to listen to communities, address feedback, and continue outreach efforts as project development progresses. Summaries of our community outreach efforts are provided as Exhibits 32 and 33.

33. **What community benefits will result from the project?**
WP2S understands and respects Kamehameha Schools' educational mission. We have entered into an agreement with KS to cooperate with KS in establishing educational programs for Hawai'i students and teachers. These programs will be designed to foster academic achievement and practical skills by working directly with students and teachers through mentorship, engagement exploration, and curriculum, with the overall goal of supporting the stewardship of the local environment through the advancement of green jobs, sustainability, and conservation.
34. **Will this solar farm delay development elsewhere in the Petition Area?**
No, in fact the reason Kamehameha Schools required us to have Parcel A fully decommissioned by the end of 2044 is so that the solar farm does not interfere with KS' plans for development of the overall Petition Area/KS Property.
35. **Will WP2S be installing the permanent buffers around the two features of the historic plantation water system, as required under the Preservation Plan?**
Yes, as to the two features that are adjacent to our solar farm site. Feature #14 (basalt-lined irrigation ditch) and Feature #19 (reinforced slope/dam) fall outside the WP2S perimeter fencing but are within the general area of the project.

Short-term protection measures were installed (caution tape) under direct supervision by archaeologist Chris Monahan on October 22, 2021, ahead of any vegetation clearing or construction in the surrounding area. Exhibit 13 shows the location of the 2 features in relation to the WP2S project, and accounts for the 10-foot buffer from the edges of the sites. Exhibit 35 is a copy of the Letter Memo from Dr. Monahan of TCP Hawai'i, LLC, documenting the installation of the short-term measures. The work was conducted according to the specifications described in the SHPD-accepted Archaeological Preservation Plan. A copy of that plan was filed as an exhibit in a prior proceeding in this Docket and can be found at this link on the Commission's website <https://luc.hawaii.gov/wp-content/uploads/2019/10/Exhibit-19-SHPD-Ltr-re-Archaeological-Preservation-Plan.pdf>

In addition to making sure that fencing stays in good working order throughout our construction period, we will also have avoidance instructions on our construction plans and specifications, and we will have a pre-construction briefing of the hired construction firms to make them aware of the preservation buffer.

Once the solar farm is fully constructed, under the approved Preservation Plan, WP2S will install permanent preservation fencing around the two features made of durable materials whose appearance is consistent with the early 20th century features it surrounds. For example, the permanent fencing may consist of t-posts or wood posts with hog wire.

A final point of clarification, WP2S is not addressing the preservation measure required for the other two features identified for preservation by SHPD. Those two features are in the far northern/eastern area of the Petition Area and are the responsibility of the Clearway solar farm developer.

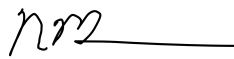
36. **Are you familiar with the conditions that Office of Planning and Sustainable Development and KS agreed to regarding this Motion?**

Yes. My understanding is that Exhibit 40 presents those conditions and to the extent the conditions apply to the Phase 1 Site solar farm, WP2S is in agreement with, and will comply with, those conditions if the Commission chooses to grant the Motion and impose those conditions.

37. **Why should the Commission say yes to this project?**

This project will advance the State's goal of 100% renewable energy by 2045. It will supply a new source of energy to help offset the upcoming planned retirement of O'ahu's 180 MW coal plant. Under HECO's estimates, this project will provide equivalent to what is needed to power approximately 18,000 homes a year for each year that it is in operations. Over the course of just 20 years, the net reduction in GHG emissions is 1,078,948 metric tons of GHG, and the avoided fuel consumption is 2,908,097 barrels of fossil fuel. Additionally, the project is projected to generate economic output of approximately \$131 Million (including direct, indirect, and induced economic effects).

This is a safe, effective project that makes a very low impact use of Urban District land and provides meaningful benefits to the State of Hawaii. On behalf of WP2S, I respectfully ask for the Commission's approval of the KS Motion so that this project can move forward.



Name: Nicholas Molinari
Santa Monica, California February 25, 2022