



HAWAII STATE ENERGY OFFICE STATE OF HAWAII

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September 3, 2021

To: Mr. Jonathan Scheuer, Chair
and Members of the State of Hawai'i Land Use Commission

Subject: Hawai'i State Energy Office Comments on Special Use Permit Application SP21-412, Mahi Solar
Tax Map Keys 9-2-001:020 portion, 9-2-004:003 portion, 9-2-004:006 portion, 9-2-004:010 portion, and 9-2-004:012 portion
Honouliuli, 'Ewa, O'ahu

Dear Chair Scheuer and Members of the Land Use Commission:

The Hawai'i State Energy Office (HSEO) offers the following comments on the Special Use Permit Application (SUP Application) for the Mahi Solar Project (Project) proposed by Mahi Solar, LLC Energy (Mahi Solar, LLC) on 620 acres across five (5) different parcels in Kunia, O'ahu. The Project would be a 120-megawatt (MW) alternating current solar photovoltaic (PV) project with a 120 MW/480 megawatt-hour (MWh) battery energy storage system consisting of approximately 362,000 ground-mounted PV modules mounted on 4,300 single-axis trackers, thirty-two four-MW inverters, a 34 kilovolt (kV) overhead collector line, a 34.5/138 kV substation, and possibly an additional 138 kV collector line. The 620 acres includes soils rated by the Land Study Bureau of the University of Hawai'i as Class B, C, D, and E, and approximately 69.5 acres are located within lands designated as Important Agricultural Lands.¹ The Department of Agriculture estimates 65% of the Project would be located on B-rated soils within the most highly productive agricultural area on O'ahu.²

HSEO supports the Project based on its renewable energy, electricity cost savings, grid-stabilization, and greenhouse gas (GHG) emission reduction benefits. HSEO believes the agricultural success of the Project would depend on Mahi Solar, LLC's ability to execute its Agricultural Plan to enable long-term commercially viable cultivation activities within the Project area. HSEO recommends Mahi Solar, LLC continue its dialogue with the stakeholders already engaged and reach out, again in some cases, to those who have not yet had the

¹ Exhibit 32, Planning Commission Findings of Fact, Conclusions of Law, and Decision and Order, Page 4, adopted July 29, 2021: <https://luc.hawaii.gov/wp-content/uploads/2021/08/Exhibit-32-FOF-COL-DO-Mahi-Solar-LLC-adopted-July-29-2021.pdf>

² Exhibit 28, Planning Commission Written Testimonies, Department of Agriculture, June 23, 2021: <https://luc.hawaii.gov/wp-content/uploads/2021/08/Mahi-Solar-2020SUP-7-FK-Dept.-of-Agriculture-testimony-6-23-21.pdf>

opportunity to discuss the Project with Mahi Solar, LLC. HSEO acknowledges many important issues have been raised in the comments submitted during the Planning Commission process.³

HSEO’s comments are guided by its statutory purpose under Hawai‘i Revised Statutes §196-71 and its mission to promote energy efficiency, renewable energy, and clean transportation to help achieve a resilient, clean energy, and ultimately carbon negative economy. As an island community currently dependent on imported fossil fuels for over 60% of its electrical power, Hawai‘i is particularly vulnerable to fuel and energy supply disruptions, unpredictable fuel cost fluctuations, unintended fuel releases impacting both marine and terrestrial environments, and the many impacts associated with climate change. That is why Hawai‘i’s 100% renewable energy goal is critical to the health, safety, affordability, and well-being of Hawai‘i’s residents. It is important that reaching 100% renewable electricity generation by 2045 be done in a manner that prioritizes the health, safety, and well-being of Hawai‘i’s residents, natural resources, culture, and environment.

Energy

The Project is currently the largest solar plus storage project being proposed in the state of Hawai‘i and would be capable of generating equivalent power for about 37,000 O‘ahu homes a year.⁴ Hawaiian Electric estimates the Project would increase O‘ahu’s annual renewable portfolio standard (RPS) by an average of just over 3.5 percentage points over the 25-year commercial operations lifetime of the Project.⁵

The Project would provide much-needed renewable energy to help replace the 12-16% of O‘ahu’s electricity generation that will be lost upon the planned retirement of O‘ahu’s 180 MW coal power plant on September 1, 2022.⁶ When the coal plant retires, the energy that cannot be conserved or replaced by renewables will come from other fossil fuel sources, further underscoring the importance of developing renewable energy and storage projects promptly. In addition, Hawaiian Electric also plans to retire its combined 92.6 MW Wai‘au 3 and 4 fossil fuel power generators located in Pearl City in 2024. The Project would support the future retirement of these units.

³ Exhibit 11, Agency Comments on the SUP Application: <https://luc.hawaii.gov/wp-content/uploads/2021/08/Exhibit-11-Agency-Comments.pdf>

⁴ Exhibit 15, Mahi Solar Project Application for State Special Use Permit (Revised), Page 3-1, March 2021: <https://luc.hawaii.gov/wp-content/uploads/2021/08/Exhibit-15.pdf>

⁵ Hawaiian Electric Subsequent Filing of Exhibits, Exhibit B, For Approval of a First Amendment to Power Purchase Agreement for Renewable Dispatchable Generation with Mahi Solar, LLC, Docket No. 2020-0140, August 18, 2021:

<https://dms.puc.hawaii.gov/dms/DocumentViewer?pid=A1001001A21H18B00720J03436>

⁶ The power purchase agreement between Hawaiian Electric and coal plant operator, AES, expires on September 1, 2022. Under state law (Act 23, 2020), all coal burning for electricity must cease by December 31, 2022.

The power purchase agreement (PPA) for the Project between Hawaiian Electric and Mahi Solar, LLC was approved by the Hawai‘i Public Utilities Commission (PUC) on December 30, 2020.⁷ Currently, the guaranteed commercial operation date for the Project is December 31, 2023; however, on July 30, 2021, Hawaiian Electric submitted a PPA Amendment to the PUC requesting approval to accelerate the Project schedule and achieve an earlier guaranteed commercial operations date of September 30, 2023, for an increased unit price.⁸ With this accelerated schedule, the Project could help minimize the potential for a period of tight generation reserves for O‘ahu’s electric grid from July to October 2023 as projected by the Hawai‘i Natural Energy Institute (HNEI).⁹ Hawai‘i’s electric utilities are required by the PUC to have sufficient power generation reserves on standby in case the normal power supply is disrupted for any reason such as the shutdown of one or more large power generators.

Under the original PPA, the fixed unit price for the electricity sold to Hawaiian Electric would be \$0.097 per kilowatt-hour (kWh), which Hawaiian Electric estimates could save typical residential customers consuming 500 kWh per month approximately \$1.38 per month on average for the term of the PPA.¹⁰ Under the PPA Amendment, the fixed unit price for the electricity sold to Hawaiian Electric would be \$0.100345 per kWh, which Hawaiian Electric estimates could save typical residential customers consuming 500 kWh per month approximately \$0.59 per month on average for the term of the PPA.¹¹ The SUP Application states that over its 25-year lifetime the Project would avoid the consumption of 18 million gallons of oil per year, thus saving O‘ahu consumers an estimated \$175 million over the project lifetime based on future oil price projections.¹²

According to the U.S. Environmental Protection Agency’s Greenhouse Gas Equivalencies Calculator, displacement from the Project’s annual generating capacity of 271,525

⁷ Decision and Order No. 37515, For Approval of Power Purchase Agreement for Renewable Dispatchable Generation with Mahi Solar, LLC, Docket No. 2020-0140, December 30, 2020:

<https://dms.puc.hawaii.gov/dms/DocumentViewer?pid=A1001001A20L30B45115B00135>

⁸ Letter from Hawaiian Electric Company, For Approval of a First Amendment to Power Purchase Agreement for Renewable Dispatchable Generation with Mahi Solar, LLC, Docket No. 2020-0140, July 30, 2021: <https://dms.puc.hawaii.gov/dms/DocumentViewer?pid=A1001001A21G30B44217C01000>

⁹ Grid Planning for a Modern Power System in Hawai‘i, Slide 10, PUC Docket No. 2021-0024, March 15, 2021: <https://dms.puc.hawaii.gov/dms/DocumentViewer?pid=A1001001A21C23B41114D03112>

¹⁰ Decision and Order No. 37515, For Approval of Power Purchase Agreement for Renewable Dispatchable Generation with Mahi Solar, LLC, Docket No. 2020-0140, Pages 39-40, December 30, 2020: <https://dms.puc.hawaii.gov/dms/DocumentViewer?pid=A1001001A20L30B45115B00135>

¹¹ Hawaiian Electric Subsequent Filing of Exhibits, For Approval of a First Amendment to Power Purchase Agreement for Renewable Dispatchable Generation with Mahi Solar, LLC, Docket No. 2020-0140, Page 2, August 18, 2021:

<https://dms.puc.hawaii.gov/dms/DocumentViewer?pid=A1001001A21H18B00720J03436>

¹² Oil prices are projected to rise according to the United State Energy Information Administration: <https://www.eia.gov/outlooks/steo/report/prices.php>. HSEO has calculated that if oil prices over the project lifetime are similar to actual historical Oahu oil prices over the past 15 years, savings would be \$389 million over the lifetime of the project.

MWh would be equivalent to reducing carbon dioxide emissions by 192,425 metric tons annually or taking approximately 41,840 average passenger vehicles off the road for one year.¹³ As a part of the Project’s GHG analysis, the net estimate GHG reduction for the Project’s lifecycle (25-years) is equivalent to 2.98 million metric tons of CO₂-equivalent. Life-cycle assessments consider the upstream emissions associated with the Project including extraction of raw materials, the manufacturing and transportation emissions, and emission associated with project construction. Downstream emissions are also considered including the potential emissions associated with decommissioning. These reductions in emissions are key to the State’s broader decarbonization goals.

Decommissioning

On November 23, 2020, Mahi Solar, LLC informed the PUC a general decommissioning plan with reclamation cost estimates would be developed prior to commencing Project construction. Mahi Solar, LLC also stated Project decommissioning will have a “bond or other credit facility, in favor of the landowner of the Project site, to ensure that decommissioning is completed at the end of the life of the Project and land restored as close as possible to prior condition.”¹⁴ Finally, Mahi Solar, LLC stated a more specific decommissioning plan would be developed closer to the end of the life of the Project which will provide additional “detail regarding the vendors, locations and specific steps in the recycling and disposal of the project components.”¹⁵

In its Decision and Order approving the PPA for the Project, the PUC acknowledged the speculative nature of planning for decommissioning activities that will take place 25 years in the future. It also acknowledged the policies and related industries for managing the end-of-life treatment of PV and storage projects are still maturing. However, the PUC required Hawaiian Electric to work with Mahi Solar, LLC, to develop a comprehensive end-of-life management plan for the Project’s components including treatment for each component, expected costs, and third-parties expected to provide the decommissioning service.¹⁶ The PUC gave the parties five (5) years to file the end-of-life management plan, which would be December 30, 2025.

Recognizing the growing question of how to manage used clean energy products (including PV panels, batteries, and other components) that have passed their useful life, on June 28, 2021, Governor Ige signed Act 92, which requires HNEI, in consultation with the Hawai‘i

¹³ United States Environmental Protection Agency, Greenhouse Gas Equivalencies Calculator, 2021: <https://www.epa.gov/energy/greenhouse-gas-equivalencies-calculator>

¹⁴ Mahi Solar, LLC’s Responses to Commission’s Information Requests, PUC-MAHI-IR-101 to 102, Issued November 16, 2020, Docket No. 2020-0140, Pages 4-6, November 23, 2020: <https://dms.puc.hawaii.gov/dms/dockets?action=search>

¹⁵ Id.

¹⁶ Decision and Order No. 37515, For Approval of Power Purchase Agreement for Renewable Dispatchable Generation with Mahi Solar, LLC, Docket No. 2020-0140, Pages 63-64, December 30, 2020: <https://dms.puc.hawaii.gov/dms/DocumentViewer?pid=A1001001A20L30B45115B00135>

Department of Health, to conduct a comprehensive study to determine best practices for disposal, recycling, or secondary use of clean energy products in the State of Hawai‘i.¹⁷ In introducing this legislation, the Hawai‘i State Legislature recognized the potential harm to the environment if used clean energy products are not recycled or disposed of properly, as well as the potential market value of recovered materials and elements.

Agriculture

HSEO defers to DOA’s comments on the agricultural aspects of the Project, but believes Mahi Solar, LLC’s Agricultural Plan (Appendix C, March 2021) is the most comprehensive such plan for any utility-scale solar project in Hawai‘i. Partnerships with local agricultural interests are key to the successful implementation of the Agricultural Plan, which identifies several prospective partners including the Hawai‘i Agricultural Research Center (HARC), Hartung Brothers, O‘ahu Grazers, Kunia Country Farms, Alluvion, Fat Law Farms, and Island Bee Removals.

Stakeholder Engagement

Chapter 7 of the SUP Application identifies the following community and stakeholder engagement activities that have been conducted or will be conducted by Mahi Solar, LLC for the Project:¹⁸

- Virtual public meetings for the Project on July 15, 2020, and October 29, 2020.
- Meetings with various State and City & County of Honolulu agencies in 2020.
- Ongoing outreach with key community stakeholders through presentations to organizations such as Kunia Ridge Farmlands.
- One-on-one interviews with cultural practitioners from the region.
- Presentations are planned for the two neighborhood Boards in the Project area: Waipahu (No. 22) and Mililani-Waipu‘o-Melemanu (No. 25).

Chapter 7 of the SUP Application states the following issues and concerns were most prevalent during the past outreach:

- Loss of agricultural land.
- Concerns about the viability of co-location of solar panels with plants or crops.
- Potential impacts to the ‘elepaio, pueo, and ‘ope‘ape‘a (Hawaiian hoary bat) due to the Project’s proximity to their habitats.
- Loss of access to cultural resources and impacts to historic sites.

¹⁷ House Bill 1333 HD1 SD1 CD1, Hawai‘i State Legislature, 2021:
https://www.capitol.hawaii.gov/session2021/bills/HB1333_CD1_.htm


¹⁸ Exhibit 15, Mahi Solar Project Application for State Special Use Permit (Revised), Page 7-1 to 7-2, March 2021: <https://luc.hawaii.gov/wp-content/uploads/2021/08/Exhibit-15.pdf>

- Use of equipment made outside the United States.
- Glare from the panels and the possibility of an associated heat island effect.
- Decommissioning and disposal of the Project materials (panels, inverters, transformers, etc.) upon the end of the Project lifetime.
- Stormwater runoff due to the impervious surface of the panels and impacts to city and county stormwater fees.
- Impacts to views and public view planes.
- General interest in the Project's renewable energy contribution.

The SUP Application includes the mitigation measures proposed by Mahi Solar, LLC for each of the above concerns. HSEO encourages Mahi Solar, LLC to continue its stakeholder engagement and agency consultation to address these impacts and those identified in the written comments, identify any other community concerns, and discuss mitigation. Every project has some degree of impact and only through close coordination with community members and stakeholders can the identified impacts be mitigated or minimized to an acceptable degree. HSEO encourages Mahi Solar, LLC to continue reaching out to stakeholders who may have an interest in the Project but who have not yet had the opportunity to engage.

Finally, HSEO believes this is a critical project for our energy transformation given its role related to ending the use of coal in Hawai'i. We hope this project receives your approval, and we request that the LUC make a timely decision to ensure that all involved can integrate your decision into how we all move forward given the importance of the Project to the island's energy resources.

Thank you for the opportunity to provide these comments. If you have any questions, please feel free to contact Cameron Black, Renewable Energy Program Manager, at (808) 367-3955 or cameron.b.black@hawaii.gov.

Sincerely,


Scott J. Glenn
Chief Energy Officer