HOST PARK

2022-2023
Annual Report

Natural Energy Laboratory of Hawaii Authority

mission statement:

“To develop and diversify Hawai‘i’s economy by providing resources and facilities for energy and ocean-related research, education and commercial activities in an environmentally-sound and culturally-sensitive manner.”

In conjunction with Chapter 227D-3 Hawaii Revised Statutes

nelha.hawaii.gov

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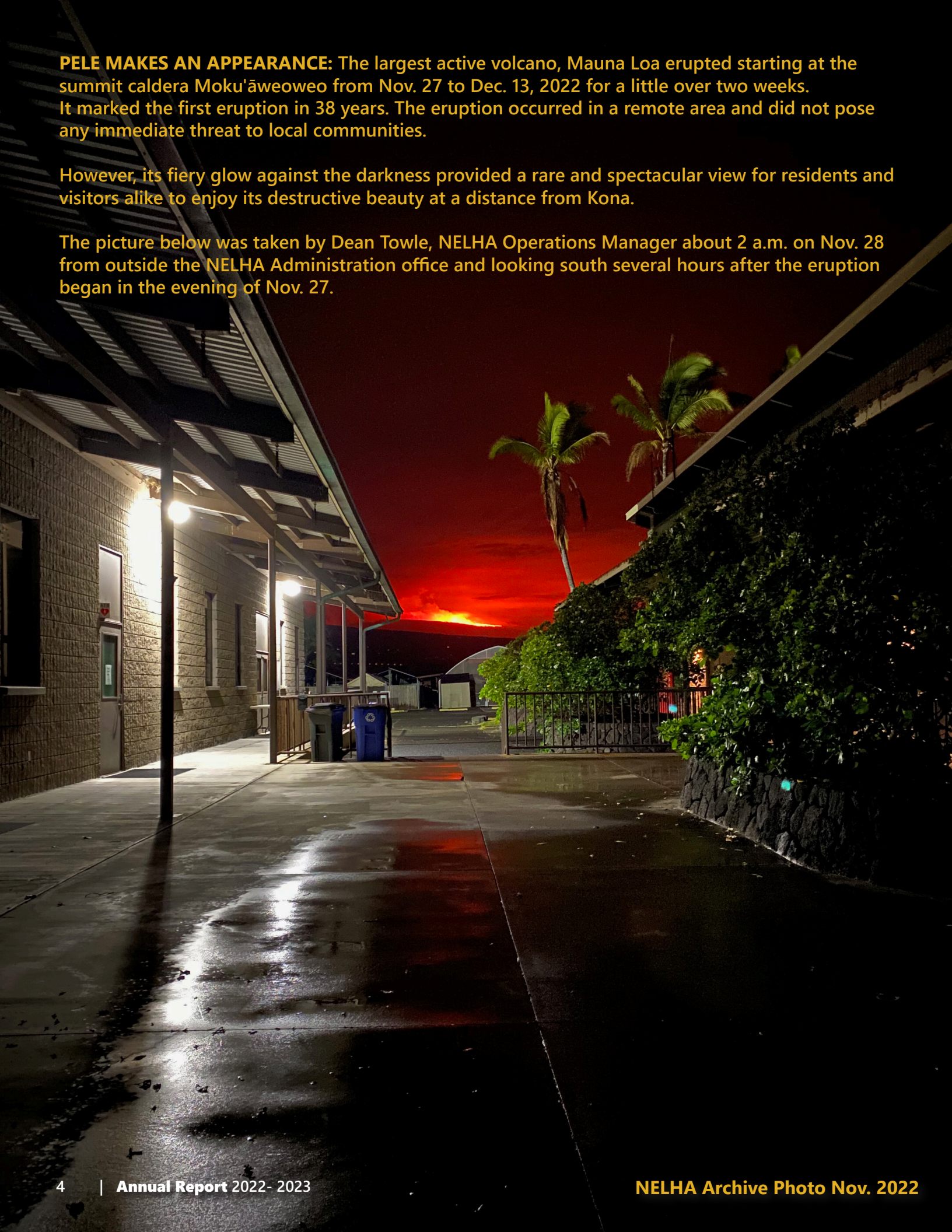
PELE MAKES AN APPEARANCE: The largest active volcano, Mauna Loa erupted starting at the summit caldera Moku'āweoweo from Nov. 27 to Dec. 13, 2022 for a little over two weeks. It marked the first eruption in 38 years. The eruption occurred in a remote area and did not pose any immediate threat to local communities.

However, its fiery glow against the darkness provided a rare and spectacular view for residents and visitors alike to enjoy its destructive beauty at a distance from Kona.

The picture below was taken by Dean Towle, NELHA Operations Manager about 2 a.m. on Nov. 28 from outside the NELHA Administration office and looking south several hours after the eruption began in the evening of Nov. 27.



NELHA Archive Photo Nov. 2022

Major Goals and Key Objectives

The purpose of the Natural Energy Laboratory of Hawaii Authority (NELHA) is to participate in the development and diversification of the Hawaii economy by providing resources and facilities that will facilitate research, development, and commercialization of natural energy resources and ocean-related research, technology, and industry in Hawaii and to engage in retail, commercial, or tourism activities that will financially support that research, development, and commercialization at a research and technology park in Hawaii in an environmentally sound and culturally sensitive manner.

This is achieved through marketing, managing and operating facilities that provide sites and resources to support the research, development and commercialization of innovative technologies utilizing the natural resources available at Keahole Point, such as cold deep seawater, warm surface seawater, and high solar energy. These technological advances have the potential to spin off new industry development, providing both local economic development as well as worldwide export potential.

The overall goal of NELHA's efforts is to continue developing the Hawaii Ocean Science and Technology Park (HOST Park) in alignment with community needs as the premier ocean science technology park in the world which will grow the economic impact and jobs by expanding and enhancing the physical environment and entrepreneurial ecosystem for new and existing ocean economy related businesses, especially in the food security, energy security, ocean technology and ocean conservation sectors.

- Grow revenue by increasing the lease of land and sale of seawater to maintain operating self-sufficiency.
- Maintain reliability and safety and increase energy efficiency of NELHA seawater system.
- Increase accessibility to remaining undeveloped lands.
- Increase potable water availability to allow for increased growth.
- Continue to align NELHA goals to the changing needs of the community that ultimately fosters comprehensive growth which supports the community.
- Facilitate research, development, and commercialization of advanced energy technologies.
- Grow aquaculture accelerator.
- Seek funds to establish a new accelerator and follow-up venture fund for ocean technology and ocean conservation.
- Continue efforts to plan and complete additional facilities to "tee-up" and provide new office, warehouse, and incubator space for start-up businesses.

Economic Impact

NELHA's HOST Park Jumps Significantly in 2022

According to a recent University of Hawaii Economic Research Organization (UHERO) analysis, like other sectors of Hawaii's economy that were not hit hard by the COVID Pandemic, economic activity at NELHA served has a stabilizing force during these difficult times.

During the four-year period from 2018 to 2022, in real dollars adjusted for inflation, NELHA's economic impact expanded significantly, with total output rising by almost 20% from $122 million in 2018 to $145.4 million in 2022 (in 2022 dollars). State tax revenues at $7.0 million and 714 jobs generated also increased by 23% and 20%, respectively.

Interestingly, during the same period, the state's total economic output, measured by real gross state product, decreased by 2.6% and payroll jobs fell by 6.1%. Therefore, relative to Hawaii's overall economy, NELHA's economic impacts, as measured by total output in real dollars, increased by almost 22% from 2018 to 2022.

The analysis also shows that total NELHA tenant expenditures were estimated at $148.4 million, of which approximately $90.3 million (or 61%) were paid to Hawaii entities, which represents an increase of 36% and 18%, respectively from 2018 levels (all measured in 2022$s). Again, this growth is against a backdrop of a 2.6% contraction in the Hawaii economy during this same period.

Over the past ten years, NELHA has received on average about $2 million per year through appropriated CIP funds for site development. As such, the State's return on these expenditures is very high as each dollar of state expenditures toward NELHA results in over $62.2 of output generated in the Hawaii economy.

This is especially encouraging that NELHA is targeting the correct sectors to assist in economic diversification away from the visitor industry. Further, given this surge in economic impact is this clear that these sectors are somewhat resilient to those issues experienced during times of economic uncertainty and can stand up to economic weaknesses.

Major Goals and Key Projects
FISCAL YEAR 2022

OVERALL RESULTS:

We continued to make significant progress in FY 2022 with a small staff of 15 at NELHA. From a financial perspective, NELHA managed a total of approximately $15.6M in projects.

Of this $5.3M is Special Funds, $5.0M is Federal Grants, and $5.3M in previously funded CIP projects.

Despite the pandemic, we successfully pumped eight billion gallons of seawater without interruption to the over 50 businesses at HOST Park during the year. We saw the number of new businesses continue to grow and only one business was forced to close.

With adequate safety precautions and sanitary gear, we were able to maintain a 40-hour work schedule with all staff reporting to work at HOST Park daily during FY 2022.

FY 2022

$15.6M
NELHA's BUDGET
$5.3M Special Funds
$5.0M Federal Grants
$5.3M CIP Projects

$4.65M
FY 2022 REVENUE

50+
BUSINESSES SERVED

Major Goals and Key Projects
FISCAL YEAR 2023

OVERALL RESULTS:

NELHA managed a total of over $20M in projects in FY 2023.

Of this, $5.4M is Special Funds; $7.7M is Federal Grants; and $7.3M in CIP projects.

Revenue for FY2023 was $5.4M.

This is an increase of over $750,000 or 15% over the last fiscal year.

HOST Park leases base rent increased by approximately $200,000 or 10% based on new leases in FY 2023.

FY 2023

$20M
NELHA's BUDGET
$5.4M Special Funds
$7.7M Federal Grants
$7.3M CIP Projects

$5.4M
FY 2023 REVENUE

4%
INCREASE IN REVENUE OVER PREVIOUS YEAR

Hawai'i Ocean Economy

expand our oceans' potential while safeguarding its long-term health

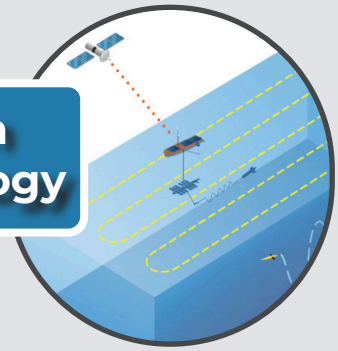
"Inā mālama 'oe i ka kai, mālama no ke kai iā 'oe. Inā mālama 'oe i ka 'āina, mālama no ka 'āina iā oe."

1 ALIGN
A new approach to grow this cluster, aligning community, regional investments and an emerging entrepreneurial system.

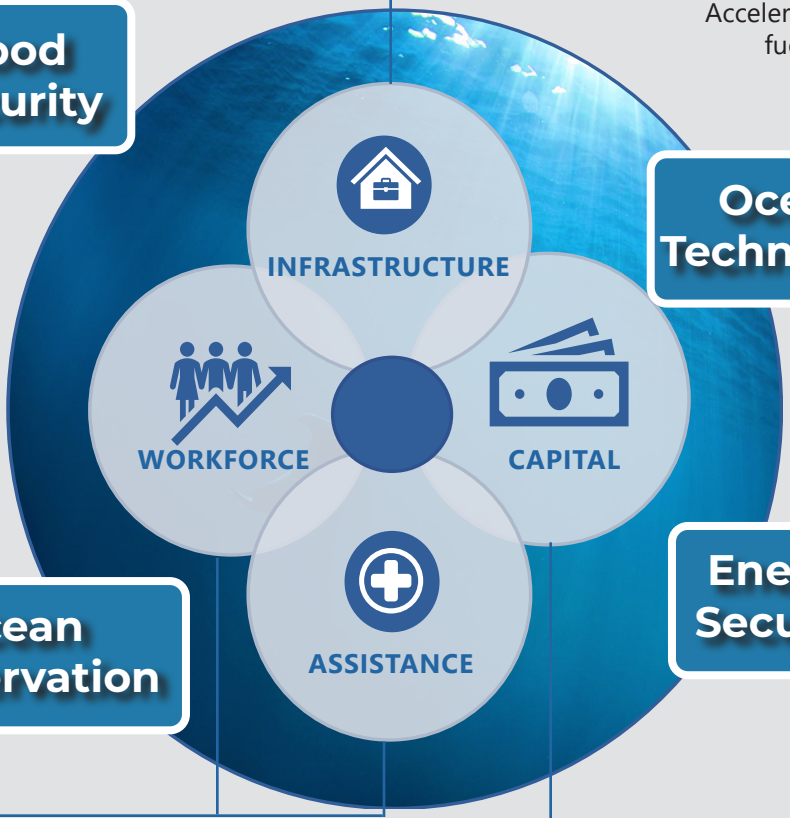
2 FOUNDATION
Expand and develop the new innovation Hub in Kona, with unique and sustainable competitive advantage. Link up with other hubs in Makapuu and Coconut Island.

3 ACCELERATE
Accelerator programs at the Hub provide fuel to thrust cluster startups ahead.

Food Security



Ocean Technology



Ocean Conservation

Energy Security

5 SUPPORT
Ensure opportunity for everyone and build cluster strength for the long haul.

4 VALIDATE
To sustain the cluster, companies must prove their solutions.

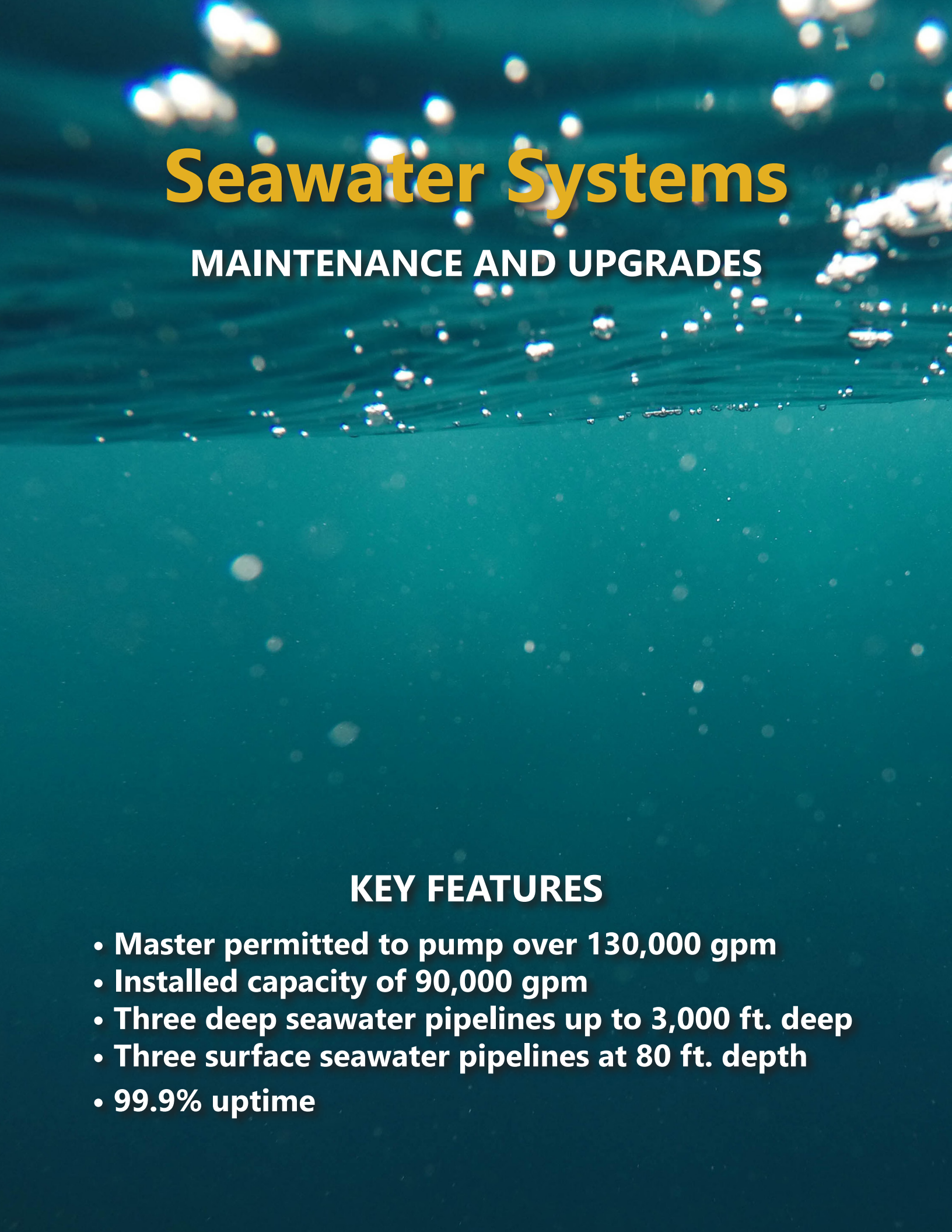
CAPITAL
$56MM++ available to address capital through the SSBCI program
Complementary Project

Hawaii's Blue Economy

Many of the building blocks for a thriving Blue Economy cluster in Hawaii are already in place with world-class government infrastructure assets; education and R&D foundations; an increasing number of entrepreneurial ecosystems and talent development programs; and non-profit-led community improvement projects. Notably, the cluster offers good-paying job opportunities on all islands, including traditionally underserved populations.

On a broader scale, growing this cluster will also improve the competitive position and balance of trade for the US and help the US build global dominance in ocean innovation and conservation technologies. In the long-term, it makes good businesses sense for NELHA to focus on Food Security, Energy Security, Ocean Technology, and Ocean Conservation as shown on the infographic.

Hawaii can focus on critical areas where we already developed comparative advantages with a proven track record, both nationally and internationally.



Seawater Systems

MAINTENANCE AND UPGRADES

KEY FEATURES

- Master permitted to pump over 130,000 gpm
- Installed capacity of 90,000 gpm
- Three deep seawater pipelines up to 3,000 ft. deep
- Three surface seawater pipelines at 80 ft. depth
- 99.9% uptime

Seawater Systems
GOALS & KEY PROJECTS
FISCAL YEAR 2022

1. Continue to maintain 99.9% uptime and review options to increase the efficiency of the seawater system by 1% in terms of power consumption per gallon.

RESULTS:

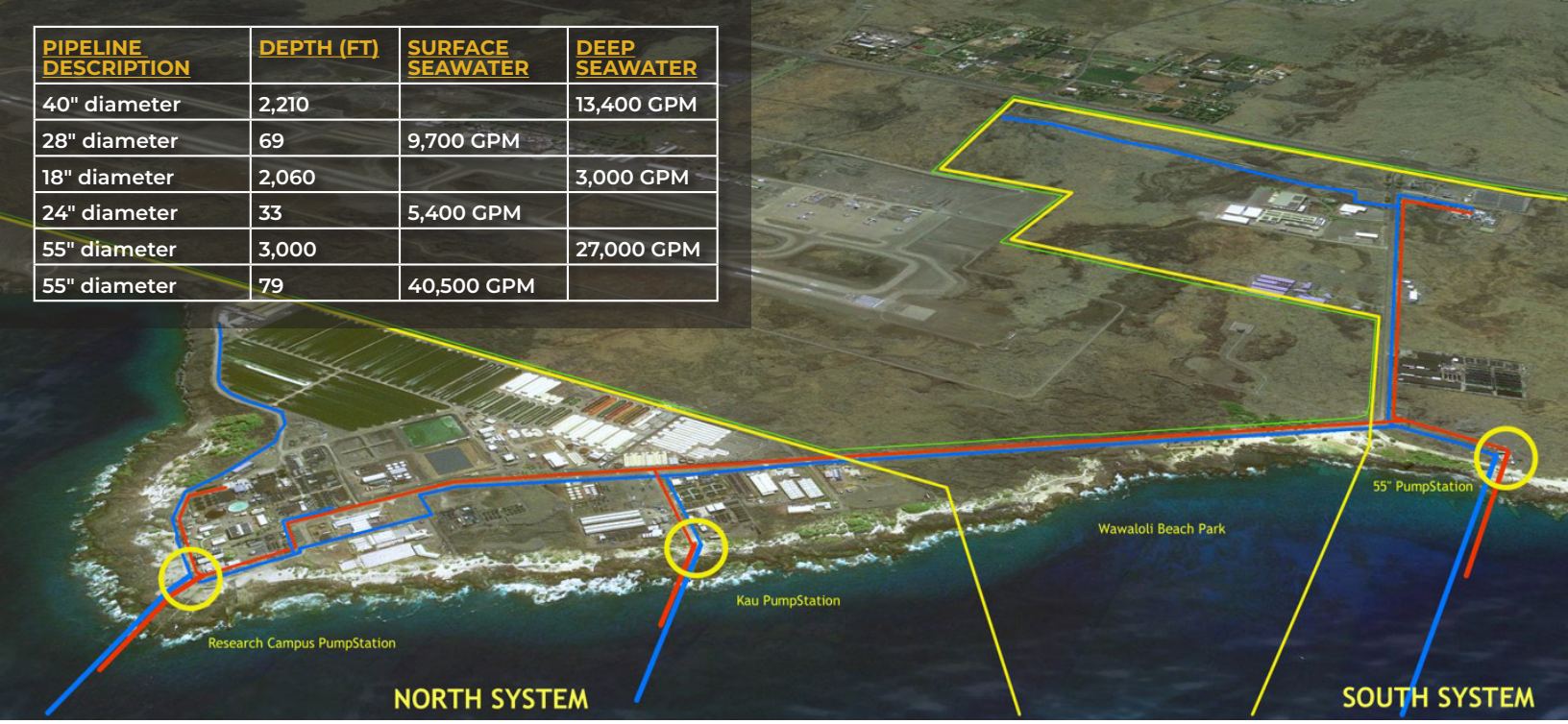
NELHA's Operations Department continues to deploy strategies to keep the cost of delivered seawater as low as possible while maintaining an uptime of 99.9% (less than 50 min/pump system/year being offline). These strategies include operating the minimum number of pumps to meet client demand and matching pump capacity with pump station demand.

This is achieved by pump selection and/or throttling valves to bleed excess capacity from higher-pressure systems to lower-pressure systems, where there are capacity limitations. In short, by continuously monitoring client demand in SCADA, NELHA Operations Department selects the most efficient pumps available to perform the work required by client demand while minimizing the number of pumps running.

About 50% of the cost of delivered seawater is associated with the electricity rate at $.29 kWh - the same threshold rate for NELHA's electrical surcharge.

NELHA Archive Photo Nov. 2012

PIPELINE DESCRIPTION	DEPTH (FT)	SURFACE SEAWATER	DEEP SEAWATER
40" diameter	2,210		13,400 GPM
28" diameter	69	9,700 GPM	
18" diameter	2,060		3,000 GPM
24" diameter	33	5,400 GPM	
55" diameter	3,000		27,000 GPM
55" diameter	79	40,500 GPM	



Historically there are two major cost components to the operations of the NELHA seawater pumping utility: electrical and operational. Electrical costs are the major cost in the system and are driven by the price of electricity.

Approximately 50% of the cost of delivered seawater is associated with the price of electricity when the electrical rates are approximately $0.29 kWh, the threshold rate for the NELHA electrical surcharge.

As electrical rates increase beyond the $0.29 kWh threshold, so does the percentage of the electrical cost component to the delivered seawater. NELHA is working on bringing the electrical cost down with the construction of the 55” Pump Station Microgrid Project, expected to be online towards the end of FY 2023.

Operational costs have two areas of concern: maintenance cost and operational efficiency. Maintenance costs are the dominant cost in the operational cost category. Pump maintenance costs can be broken down into parts supplies, and labor. It is a guesstimate that the maintenance component represents 80 – 90% of the total cost in this category.

In order to manage the maintenance cost, NELHA has started to transition in FY 2022 from a system of fixing pumps when they fail to a system of maintaining the pumps based on hours of service. The latter should reduce unscheduled downtime and increase system readiness.

NELHA continuously monitors pump station efficiency on its SCADA System as the amount of kW required to pump a kgal of seawater or kW/kgal. The lower the kW/kgal value, the more efficient the pump system is. Currently, pump efficiency is the least costly aspect of the pumping system as most of the major savings are automatically controlled by variable frequency drives (VFD).

The VFD controls the pressure measurements in the system while matching pump delivery volume with client demand volume.

Pump efficiency can be viewed from the point of view of individual pump systems, in which NELHA operates six pump systems, or as an overall system. NELHA Operations Department has been

focused on maintaining overall efficiency by emphasizing reducing maintenance costs and increasing operational readiness over operating each of the six-pump systems at maximal efficiency.

The premise of this strategy is to reduce the total number of hours on our pump systems in the hopes of reducing maintenance costs and increasing pump readiness. Pump readiness is having available backup pump systems on standby, ready-to-go, in the event of a pump failure. NELHA mostly achieves this strategy by bleeding underutilized pump capacity at higher-pressure stations to feed lower-pressure systems.

By following this strategy, the electrical cost is slightly higher due to pumping a larger volume of water at our higher-pressure pump systems. However, there are cost savings even though the overall electrical cost is higher. These savings are found in the reduced maintenance cost of operating the minimal amount of pumps to meet the overall system client demand.

By in large, the low-pressure system utilizes 0.28 to 0.34 kW/kgal to deliver seawater to NELHA's clients while higher-pressure systems utilize 0.34 to 0.40 kW/kgal. Typically, NELHA is utilizing 600 gpm of higher-pressure water in its lower-pressure system to avoid adding additional pumps into services. This strategy adds approximately 1555 kWhr/month of supplementary electrical usage or, approximately $730/month at an electrical rate of $0.47/kW per hour.

Maintenance for the additional submersible pump required to meet client demand is typically much greater than the electrical savings. Rebuilding a typical submersible pump is around $15,000 - $25,000 depending on pump size and the type of failure. In addition to the pumps, VFD typically fails with increased hours of usage too.

A typical VFD replacement cost is between $15,000 to $25,000. An additional benefit of this strategy, NELHA keeps its overall pump system at a higher state of readiness with a minimal number of pumps operating. In general, the more pumps running the less available standby pumps in the system.

NELHA Operations Department worked closely with an Akamai Internship Student in the latter part of FY 2022 and early FY 2023 on a seawater system risk assessment study.

The outcome of this two-month study yielded a prioritization list of multiple operational and safety issues in the seawater system from most risky and least costly to fix, to least risky and most costly to fix.

The outcome of this study has provided a basic maintenance road map NELHA Operations Department will follow to address system issues in
FY 2023 and beyond.

Moving forward, NELHA Operations Department has designated four scheduled seawater system shutdowns to address deferred maintenance to its pipeline distribution system and other safety issues outlined in the risk assessment study for FY 2023 and FY 2024. These additional scheduled shutdowns will decrease the system's 99.9% uptime to 99.9% with the scheduled shutdowns.

However, the scheduled shutdown should address areas where NELHA could potentially experience a catastrophic failure. By addressing the identified issues from the risk assessment study, NELHA is improving the overall system to a higher level of readiness, while increasing its pumping capacity from the COVID pandemic seawater demand lows to meet client demand as they grow their business.

2. Complete a detailed locational survey using underwater remote-operated vehicles of deep seawater pipelines that were abandoned over 30 years ago.

RESULTS:

This contractor is based in Alaska and due to COVID travel restrictions, this project has been delayed. In addition, the contractor had initially significantly underestimated the current flow conditions in the survey area and had failed with their originally selected technology in mid-2021.

It is important to note that this survey project is very difficult as it takes place at depths of up to 2,000 ft. NELHA succeeded in refocusing the contractor on completing the project and the contractor scheduled the underwater survey fieldwork for late 2022.

3. Continue to develop plans and design strategies to address the long-term status of abandoned deep seawater pipelines.

RESULTS:

The completion of the plans and strategies, the second part of this project, to remove the pipelines requires information from the survey work as discussed above. Due to the delay in completing the needed underwater pipeline survey discussed above, this project is on hold. When we receive the survey information discussed above then we will issue a Notice to Proceed to start the 1 year-long design project.

4. Secure three offshore pipes (near shore).

RESULTS:

We have purchased the new hardware to secure these pipelines and already completed procurement for the services to install this hardware. However, we have delayed executing a contract due lack of funding.


NELHA Archive Photo June 2016

Given the anticipated increase in revenue in FY 2023, we plan to execute the contract and issue a notice to proceed in Fall 2022 and the installation of the hardware is proposed to complete by Spring 2023.

5. Continue to upgrade SCADA and WQL with new instruments/monitoring devices controlled by Water Quality Lab (WQL) including a new nutrient analyzer, upgrading SCADA software and adding additional monitoring devices to the SCADA system.

RESULTS:

SCADA improvements were evolutionary during FY 2022. The focus during this period was to re-organize existing enclosures by removing abandoned equipment, rewiring low voltage circuits utilizing standardized methods, and documenting the improvements for future technicians. Most of the low voltage systems improvements have been focused at the 55", ISSW and Booster Pump Stations. NELHA plans to work on the Research Campus Pump Station in FY 2023.

NELHA also installed new high-quality pressure indicators and energy meters at the Booster and ISSW pump stations. All the sensors and energy meters have been integrated into SCADA.

This also included providing the pressure control system with duplicate pressure readings and alarms at the 55", ISSW and Booster Pump Stations to ensure the pump system does not control a faulty or drifting pressure sensor.

NELHA also added a pump-prime monitoring system at the 55" pump station to indicate which pumps are primed and ready for service in SCADA.

Finally, pressure switches have been added to the intake side of the Booster and ISSW Pump Stations to automatically shut down the booster systems if supply pressure is lost. This protects NELHA's pipeline infrastructure from imploding under vacuum conditions.

The Water Quality Laboratory purchased and installed dedicated sampling well pumps for wells 1 and 13 in FY 2022. In addition, smaller improvements have been made to the laboratory procedures and methods.

There will be a more significant infrastructure improvement made in FY 2023 to replace the well heads with new concrete bases and well caps. The current bases and well caps are beyond the end of life and are prone to general public tampering. NELHA is hopeful in FY 2023 funding will be available to purchase new nutrient instruments.

Seawater Systems
GOALS & KEY PROJECTS
FISCAL YEAR 2023

1. Continue to maintain 99.9% uptime and review options to increase the efficiency of the seawater system.

RESULTS:

Uptime and operational efficiency have been key elements of NELHA's seawater pumping and distribution strategies. These key elements over the past years have been attenuated with another variable, maintenance costs. Maintenance costs are directly attributable to the number of hours a pump is in operation. NELHA has placed a higher priority in its strategic operational plans to optimize for the fewest pumps running at each pump station.

This is achieved by throttling valves to move seawater from high-pressure systems to low-pressure systems to minimize the number of pumps in operation. Recently water quality concern has risen as a significant priority. As such, NELHA has adjusted its operational strategies to include a more measured approach to how the pump system is run.

Focus has been placed on keeping the direction of flow constant in the pipes. When the direction of flow changes, there is a good chance that settled debris can be dislodged and transported to our clients. It has been speculated that debris in the pipeline systems has been problematic to the larval stage of many aquatic species.

In order to preserve 99.9% uptime, NELHA has designated four days in the calendar year as pipeline maintenance shutdowns. NELHA hopes to continue this strategy in the future, as this provides the Operations Staff time to address issues that can't be addressed when the system is in operation.

Submitted CIP request for $1.9M seawater system upgrades in Governor Green's Administration budget request and successfully passed the Legislature. Budget bill signed by Governor in June with $1.9M for upgrades. Funds will be used for: a) upgrades to the 55" pump station ($400,000); b) upgrades to the Booster pump station ($100,000); c) upgrades to the Interim Surface Seawater pump station ($100,000) and d) research campus microgrid upgrades.

2. Complete a detailed locational survey using underwater remote-operated vehicles of deep seawater pipelines that were abandoned over 30 years ago.

RESULTS:

Following the failure of the Contractor to deliver the project in 2021, NELHA succeeded in refocusing them on completing the project, and put in place the necessary contract time extension that would allow them to do so. In November 2022, the contractor remobilized from Alaska, including an ocean-going research vessel and a work-class remotely operated vehicle.

Over a period of five days, with the NELHA Project Officer on board, the contractor performed the complete pipeline survey flawlessly – locating, video-imaging and recording the position in detail of all six pipelines.

By February 2023, the contractor had performed all the data processing work and presented the contract deliverables, including an interactive GIS map of the pipelines and those features and attributes considered key to developing a strategy to mitigate the risks they pose.

3. Continue to develop plans and design strategies to address the long-term status of abandoned deep seawater pipelines.

RESULTS:

By the end of March 2023, with the results of the pipeline survey in hand, NELHA issued a time extension supplemental contract and notice to proceed to the design team contracted to perform this work. The contract allows for one year from that start date for the engineers to present their documented mitigation strategy.

4. Secure three offshore pipes (nearshore).

RESULTS:

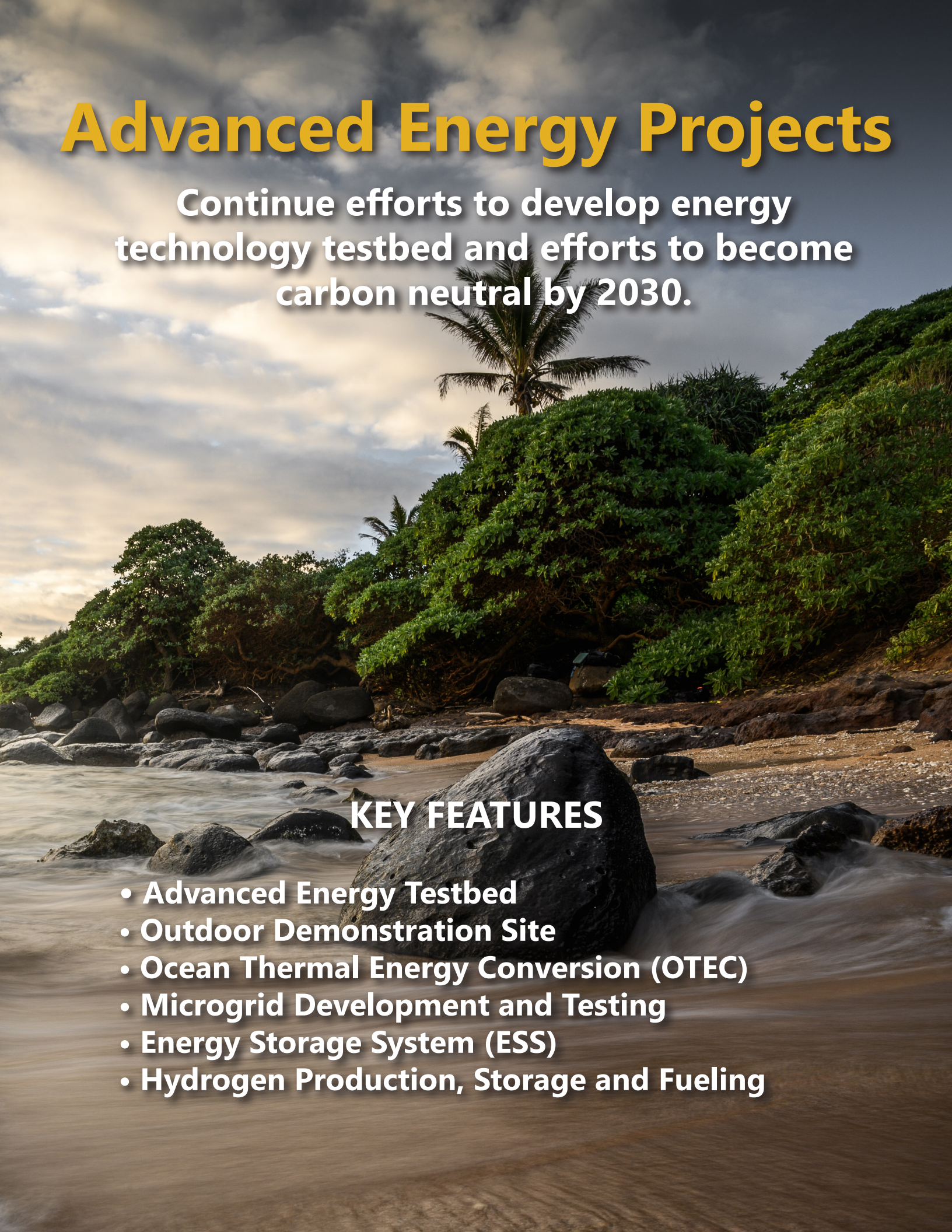
In mid-September 2022, having ascertained the availability of funds, NELHA issued a contract and notice to proceed with this work. By the end of October 2022, the contractor had secured needed specialized equipment and started work. The work proceeded as weather and sea conditions improved in early Spring 2023 and allowed the contractor to complete the project successfully.

5. Continue to upgrade SCADA and WQL with new instruments/monitoring devices controlled by Water Quality Lab (WQL) including a new nutrient analyzer, upgrading SCADA software and adding additional monitoring devices to the SCADA system.

RESULTS:

NELHA continued to upgrade its SCADA system and extend its reach. In FY 2023, the primary focus was to increase the reliability of client seawater flow meters and to add additional remote client flow meters with real-time data acquisition into NELHA's SCADA system. In addition, NELHA has deployed five additional energy meters within the facility.

Three of the energy meters are a joint project with HNEI that are covering the legs of our grid not metered. HNEI is studying harmonics caused by inverts on the NELHA grid. NELHA is waiting for a vendor to become compliant with HCE to allow us to procure and upgrade our SCADA software package. NELHA plans to upgrade its nutrient analyzer in FY 2024 due to a funding shortfall.



Advanced Energy Projects

Continue efforts to develop energy technology testbed and efforts to become carbon neutral by 2030.

KEY FEATURES

- Advanced Energy Testbed
- Outdoor Demonstration Site
- Ocean Thermal Energy Conversion (OTEC)
- Microgrid Development and Testing
- Energy Storage System (ESS)
- Hydrogen Production, Storage and Fueling

Advanced Energy Projects
GOALS & KEY PROJECTS
FISCAL YEAR 2022

There is significant value in developing an advanced energy technology testbed to address electricity delivery and grid integration problems within the site boundaries and to provide value to a stressed utility operating in an isolated island environment.

NELHA continues to engage in discussions with national labs, the University of Hawaii, local utilities, and the private sector to formulate partnerships for new joint projects in the areas of renewable energy and microgrid development.

1. Complete a long-term plan for renewable energy upgrades to HOST Park. Primary emphasis will be on achieving energy security and resiliency for critical seawater operations in the face of increasing vulnerability (especially during natural disasters) of the electric grid, uncertainty about the cost of oil-based resources, and the availability of increasing amounts of low-cost (primarily solar renewable energy resources and storage.

RESULTS:

The Hawaii Natural Energy Institute (HNEI) completed the NELHA facility energy and infrastructure assessment report in early FY 2022. This analysis documents the overall electrical grid at NELHA and provides information on typical loads, current renewable infrastructure, and emergency generation facilities resources and provides a roadmap for NELHA to realize its microgrid goals efficiently and effectively over a ten-year planning horizon. Based on this analysis, it will be most cost-effective to set a goal of 65% renewables for our energy load.

HNEI completed 35 different simulations of various HOST Park microgrid scenarios using the XENDEE Microgrid Decision Support Platform software. The results of these simulations indicate that developing two separate combined load centers will provide financial and operational benefits to NELHA.

Combining the geographically proximate load centers will allow for larger loads to enable the utilization of greater amounts of renewable energy to allow for the incorporation of increased battery or energy storage systems (ESS). In addition, two main load centers will add resiliency in the event of an outage, as renewable energy from one site could be used to provide power to the other load center.

The analysis also recommends adjusting Hawaii Electric Light Company (HELCO) switchgear to enable the entire HOST Park to load to operate in "islanded mode" completely isolated from the HELCO system. In the event of a prolonged outage, this would enable the HOST Park's critical loads to safely serve by the facility's backup generators and renewable energy resources. We completed preliminary discussions with HECO and HELCO executives they are supportive of the concept.

Finally, the results from the 35 simulations indicate that HOST Park will include significant use of ESS that will require a management system with forecasting and control. As such, the next step will be to incorporate the Encord Technologies project's artificial intelligence (AI) advanced control capabilities being developed at the 55" pump station.

Using their AI in conjunction with the new forthcoming HELCO "time of use" rates will allow for better financial decisions to initiate funding solicitations and determine its procurement strategy for microgrid projects.

The grid-scale advanced flow battery demonstration funded by Sandia National Laboratory failed and did not perform as anticipated due to manufacturer design issues. We received full payment from Sandia National Laboratory for this demonstration and we continue working with HELCO to have the equipment removed.

The manufacturer of this equipment filed for bankruptcy which greatly complicated the removal. We worked with HELCO and Sandia National Laboratory to develop plans for the removal of the equipment. We negotiated an agreement for additional funds from Sandia National Laboratory for formulating plans and to complete a report describing procedures necessary for its removal.

Developing two separate combined load centers will provide financial and operational benefits to NELHA.

2. Complete regional seawater air-conditioning study.

RESULTS:

The data collection and analysis portions of this study are complete and have found only marginal financial value in implementing a regional cooling district in North Kona - and that only if the extent is limited to the airport, and only if the DOT were to implement their Master Development plan for the area. The consultant team is preparing the final report to document their findings.

3. Complete construction of 500-kw solar power and 750 kWh energy storage system project to service the 55" seawater pump station and serve as a testbed for artificial intelligence (AI) demonstrations of ESS devices and microgrid development.

RESULTS:

The 55" Pump Station Microgrid Project has seen several delays during the COVID period (FY 2020 – FY 2022). However, the project moved forward with most of the design and planning work being completed in FY 2021. The delays experienced during FY 2022 are mostly due to Hawaii County's new permitting process that was introduced in August 2021.

Unfortunately, the submission of the 100% design plans for the 55" Pump Station Microgrid Project occurred just after the County started the changeover process to their new permitting system. The project received its construction permits in the Spring of 2022.

The construction of the microgrid will begin in the Fall of 2022 and it is planned to be operational by mid-2023. The AI research was initiated by Encord Technologies with a $2.0M grant from the Korean government and using five years of pump load data and weather information from our SCADA system.

4. Complete Phase Two implementation of the DOE SunShot grant for a solar desalination project at the KSP site and begin Phase Three.

RESULTS:

In early FY 2022, Phase Two of the Hawaii Solar Desalination Project was successfully completed. DOE agreed the project should continue into the third and final phase. Preliminary results obtained by June 2022 were very encouraging and we anticipate verification of the results in late Summer 2022.

If declared successful by DOE, we anticipate the technology partner to scale up the system's production capacity to within range of that originally targeted – a milestone upon which disbursement of remaining project funds is contingent. Given the numerous challenges with this demonstration project, we anticipate that an additional time extension to achieve the final objectives may be necessary.

Advanced Energy Projects

GOALS & KEY PROJECTS

FISCAL YEAR 2023

1. With the exact same goals as FY 2022, additional task included was to continue to facilitate the development of offshore OTEC demonstration projects.

RESULTS:

Continued to evaluate and seek funding to implement the NELHA facility energy and infrastructure assessment report completed by the Hawaii Natural Energy Institute (HNEI) last year. This analysis provides a roadmap for NELHA to realize its microgrid goals efficiently and effectively over a ten-year planning horizon. Based on this analysis, it will be most cost-effective to set a goal of 65% renewables for our energy load.

NELHA successfully received an additional $1.9M in CIP funds to upgrade the seawater system including the merging of the Mauka Research Campus and Farm Compound as recommended by the analysis.

In addition, the analysis also recommends adjusting HELCO switchgear to enable the entire HOST Park load to operate in "islanded mode" completely isolated from the HELCO system.

In the event of a prolonged outage, this would enable the HOST Park's critical loads to be safely served by the facility's backup generators and renewable energy resources.

CHECKING ON PROGRESS: Executive Director Greg Barbour conducts a walk at the 55" station microgrid construction.

NELHA Archive Photo Jan. 2023

We continue to discuss the steps with key HELCO executives and staff to implement this microgrid upgrade. Also, item no. 3 as discussed below is critical to implementing the plan.

The private sector made several advancements in patenting new breakthrough technologies that have garnered significant interest from potential funding sources for an offshore OTEC demonstration project. NELHA secured $1.5M in CIP funds to complete a programmatic EIS to develop an offshore research corridor which will facilitate demonstration of this new technology.

2. Exactly like the FY 2022 goal, complete regional seawater air-conditioning study.

RESULTS:

The consulting team started working in earnest on the final report for this feasibility study in late July 2022.

In order to ensure the final product meets NELHA's expectations for structure, the writing task has become interactive, with the NELHA Project Officer working alongside the consultant in real time to help maintain the organization of the document. Note, however, that content is solely determined by the consultant. The document was completed in June 2023.

3. Though similar to FY 2022 goal, complete construction for a higher 750 kWh energy storage system project. Use artificial intelligence advanced control capabilities developed by this project to increase the efficiency of ESS devices.

RESULTS:

Significant progress was made in the construction and testing of the 500kW solar power and 750kWh energy storage system microgrid project in FY 2023. There are a few minor items scheduled to be

completed in the Fall of 2023. The initial phase of PV and BESS testing was completed in March 2023.

Additional PV and BESS testing is scheduled for Summer and Fall 2023. The system is anticipated to begin producing power, in a test phase, in July 2023 and the BESS will be turned on, in a testing phase, in September 2023. NELHA anticipates the system permits to be issued in FY 2024 and the system to be in full production soon thereafter.

NELHA Archive Photo Sept. 2013

4. Complete Phase Three implementation of the DOE SunShot grant for a solar desalination project at the KSP site and close out the grant with DOE.

RESULTS:

The third and final phase for the DOE Sunshot project started February 1, 2022 and was initially intended to run for one year, during which the completed Forward Osmosis system would be run using heat from NELHA's Keahole Solar Power plant.

By the end of the summer of 2022 however, technical difficulties led to a request from Trevi Systems – NELHA's technology partner - for an extension of project time, which DOE approved.

The current end date for the DOE-funded work is currently July 31, 2023, and Trevi Systems are confident they can meet the project end objectives in the remaining time available.

DOE is already working with Trevi Systems to integrate their tech into other DOE programs outside Hawaii.

Despite the difficulties, DOE is already working with Trevi Systems to integrate their technology into other DOE programs outside of Hawaii.

Trevi Systems has also declared interest in extending their time at HOST Park to work on extensions of the existing desalination process – such as working towards the highly-sought after goal of eliminating the liquid brine waste stream from the desalination process - an advance known as "Zero Liquid Discharge".

This work would take place under a new tenancy agreement with NELHA, under which Trevi would pay land rent plus a "facilities use fee" for continued access to the KSP resource.

Aquaculture

Continue efforts to grow aquaculture accelerator.

KEY FEATURES

- A significant number clients are in aquaculture
- Hawaii's $90 million aquaculture industry is predicting significant growth, according to Honolulu Civil Beat
- Aquaculture sales up 12% in 2022, says US Dept. of Agriculture
- NELHA partnered with HATCH Blue Accelerator
- Gained two tenants from incubator/accelerator program

Aquaculture

GOALS & KEY PROJECTS
FISCAL YEAR 2022 & 2023

1. Manage the contract for the operation of the accelerator with Hatch Accelerator Fund Management LLC. Begin construction work on the area for expansion of accelerator operations if the EDA grant is awarded.

RESULTS:

In FY 2022, following the completion of the three-year pilot aquaculture accelerator, NELHA applied for and obtained an additional grant of $1.8M in October 2021 from the US Department of Commerce Economic Development Agency (EDA) to continue the accelerator for four years with the goal of making it a self-sustaining long-term program at HOST Park.

We are still awaiting final word on an additional $800,000 EDA grant for construction to improve incubator facilities.

The project also aims to increase occupancy at HOST Park through an associated incubator program supported by updated marketing tools. A 4-year contract was signed with HATCH and work started on October 2021.

HATCH announced the moving of its Accelerator Program division headquarters to HOST Park. HATCH completed the 1st Hawaii Innovation Studio in August 2021. HATCH also launched and completed a Woman in Aquaculture Innovations Studio in November 2021.

For FY 2023, following the closing of the Hatch Accelerator Fund II, HATCH launched its aquaculture accelerator 5.0 cohort. Ten promising companies were selected from close to 200 applications.

Three of the companies are Hawaii-based companies. The Kona portion of the program completed in mid-July 2023 after which time, the cohort will visit other HATCH sites in Norway, Singapore, and Vietnam.

In addition, earlier in the fiscal year, HATCH announced its incubator program, and the first

NELHA Archive Photo May 2023

companies are expected to start participating in that program by summer 2023.

EDA has expressed satisfaction with the results provided through the first three biennial reports.

Late FY 2023, the US Department of Commerce Economic Development Agency (EDA) executed an amendment to the original grant of $1.8M to add an additional $656,000 for capex expenses to assist with the aquaculture accelerator operations. Along with the cost share provided by HATCH, the total project budget has increased to $3.1M.

2. Manage limited partnership agreements for follow-on venture investment funds with Hatch Accelerator Funds LP for successful businesses coming out of the aquaculture accelerator.

RESULTS:

We continue to participate in quarterly/semi-annual meetings with HATCH and the other limited partners for HATCH's Hawaii's first investment fund to review financials and audit reports and monitor the progress of the portfolio companies.

For 2022, as part of the continuing 4-year accelerator program, HATCH plans to raise a second Hawaii Investment Fund with a goal of $15M.

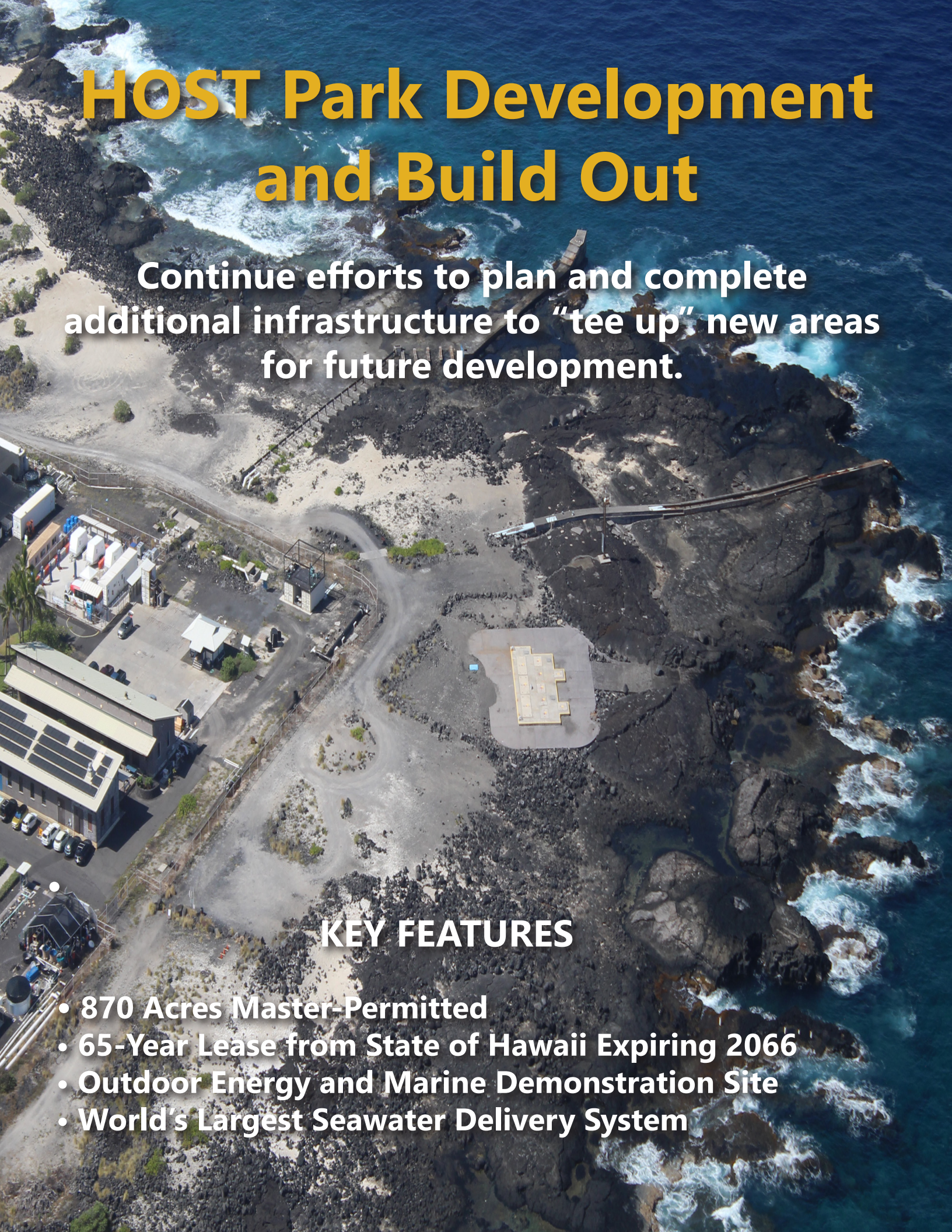
In FY 2023, HATCH closed on the first $5M of the second Hawaii Investment Fund with a goal of $10-15M to be finalized over the next year. In all, NELHA continues to advise and assist with both funds.

CLASS IS IN SESSION: Deputy Director Laurence Sombardier speaks to HATCH's 5.0 cohort about NELHA and HOST Park.

NELHA Archive Photo June 2023

HOST Park Development and Build Out

Continue efforts to plan and complete additional infrastructure to "tee up" new areas for future development.



KEY FEATURES

- 870 Acres Master-Permitted
- 65-Year Lease from State of Hawaii Expiring 2066
- Outdoor Energy and Marine Demonstration Site
- World's Largest Seawater Delivery System

HOST Park Development & Build Out

GOALS & KEY PROJECTS

FISCAL YEAR 2022

1. Continue State and Federal Environmental Assessments and, in parallel, design for the Innovation Village and Visitor Center at the north end of existing Wawaloli Beach Park facilities.

RESULTS:

Completed the draft archeological inventory survey in January 2022 and the draft environmental assessment (EA) for the proposed Innovation Center and Hale Wawaloli Visitor Center completed in April 2022 and was published in May for public comment. We received and reviewed comments in May and June and finalized the EA and found no significant impact (FONSI) by late June. This was transmitted to the Office of Planning and Sustainable Development on July 6, 2022.

In parallel, the architectural and engineering design of those facilities was initiated and was nearing 90% competition by the end of the fiscal year. NELHA has determined to stop the design process at 90% until additional funding is secured. Following the design charette in mid-2021, where key design elements were defined, at architects' suggestion, based on NELHA's design choices, it was agreed to increase the overall project budget from $6M to $8M. The next checkpoint for project cost in the process was in August 2021 as the design approached 60% completion. The architects provided an independent cost estimate based on an earlier 35% design.

However, this came with caveats of a high degree of uncertainty, due mostly to the very volatile construction market at the time, and rapidly escalating construction materials costs during the pandemic - all of which the estimate incorporated conservatively by allowing for 35% "Margins and Adjustments" to a net estimated cost increase of $12M.

We have identified an opportunity what will allow us to recover quickly and purchase an existing building.

Based on staff experience, the resulting $18M estimate appeared overly conservative, and it is assumed that upon further refinement of the plans, and a cooling of the market, the cost estimate will be paired down in its final iteration (at the 90% design stage).

Given that the existing Research Campus is nearly at full capacity and prospective tenants and users are being turned away, as an alternative to the new construction discussed above, NELHA explored the possibility of releasing an RFP to purchase an existing building at HOST Park with comparable characteristics to the expansion previously agreed upon with FEMA.

We indicated to FEMA in preliminary discussions that we have identified an opportunity that will allow us to recover more quickly and purchase an existing building that is for sale. FEMA indicated that "it should be an eligible alternative."

Accordingly, we released the RPF in April 2022 and received one proposal in response to the RFP.

The proposal with an asking price of $5M was reviewed and met the requirements of the RFP. In June 2022, we completed an appraisal of the property and improvements which showed that the value was approximately $5.1M. Our counteroffer of $4.75M was accepted and we prepared a write-up of our process and recommendation to the BOD for their review and consideration at the July 2022 meeting.

2. Continue efforts for an exploratory well for new potable water resources for NELHA. Obtain final permits required for construction and begin construction of the well in conjunction with HHFDC and DHHL. Request funding for a separate offshore survey project.

RESULTS:

This project has been on hold for several years and we are still awaiting a permit from the Commission on Water Resource Management (CWRM) to begin drilling the exploratory well. All other work has been completed.

Our permit request was discussed by the CWRM Board of Directors, and they deferred a decision in April 2021 and requested additional input from representatives of Native Hawaiian traditional and customary (T&C) practitioners and to hold a symposium to discuss "T&C" knowledge, history, and perspective of water resource use impacts on "T&C" practices along the West Hawaii coastline.

In FY 2022, CWRM began organizing a symposium to continue conversations with the Aha Moku, ʻohana and practitioners in the Keauhou area related to traditional and customary practices along coastal lands and the potential impact in association with the well development.

Because of the rise in COVID cases in late summer and early fall 2021, CWRM was not able to gather and hold an "in person" symposium however they did meet individually with Aha Moku, Hui Ola Ka Wai and 'Ohana Lee. The CWRM goal was to come up with mitigation measures and monitoring metrics to present to CWRM in early 2022.

We continue to invest significant time and effort working with CWRM staff, well-development partners HHFDC and other stakeholders in keeping the process moving forward.

We are also exploring alternative options such as desalination and offshore freshwater seeps. In this regard, we requested and received $500,000 in CIP funds for development to access deep-layer aquifers discharging into the ocean offshore at a depth of 2,000 ft to supply fresh water.

These funds will expand prior marine surveys that have discovered deep freshwater aquifers using non-invasive marine electrical imaging that will provide additional information to determine the size, likely yield and more exact depths of these aquifers that could be utilized as a new low-cost freshwater resource to supply the increasing demand for water by State agencies in West Hawaii. NELHA plans to work with the University of Hawaii to complete this work.

3. Continue efforts to Update the Master Plan for HOST Park including requesting funds for an update of the Comprehensive EIS for HOST Park and Offshore EIS.

RESULTS:

Requested and received $1.5M in CIP funding for Comprehensive EIS update for onshore lands. Did not receive funding for the offshore EIS.

NELHA Archive Photo Dec. 2022

4. Work with other State and County agencies to prepare applications for EDA American Rescue Plan Act Build Back Better Regional Challenge Grant Phase I to develop an Ocean Economy Regional Cluster in Hawaii.

RESULTS:

This exercise led to the Department submitting a grant application to the Economic Development Administration for the "Build Back Better" funding opportunity. The final Phase One proposal submitted for $500,000 was to further develop the ocean economy in Hawaii.

Our proposal was not funded but led to NELHA working closely with the Hawaii Technology Development Corporation, Hawaii Green Infrastructure Authority, and Hawaii State Energy Office to draft this proposal.

NELHA has been working closely with HTDC, Hawaii Green Infrastructure Authority and Hawaii State Energy Office.

5. Evaluate alternatives to formulate an RFP to select a developer for the Ocean CenterPiece including preparation of a master plan for this 80-acre site. Begin efforts to complete the market survey to assist in formulating the RFP.

RESULTS:

Postponed due to EIS update process initiation.

A NEW START: Matsuyama brothers and their father broke ground for their third convenient store, restaurant and fueling station at the Kahilihili location.

NELHA Archive Photo Nov. 2021

Research Campus

- 6A master-permitted
- on shoreline w/ ready-ocean access
- 1 day turn-key setup
- surface and deep ocean water available
- short-term leases by sq. ft.
- incubator office building (14,000 sq. ft.)
- wet lab (4,000 sq. ft.)
- covered storage space (6,000 sq. ft.)
- seminars/conferences
- small college campus atmosphere
- assets include SCADA, PV and ESS testbed; OTEC; H2 production, storage and fueling

HOST Park Development & Build Out

GOALS & KEY PROJECTS

FISCAL YEAR 2023

1. Complete Design for the Innovation Village and Visitor Center at the north end of existing Wawaloli Beach Park facilities up to 90% and secure funding.

RESULTS:

Design plans and specifications for both the first phase of the Innovation Village and for a new Wawaloli Beach Park Visitor Center were approaching the 90% completion stage by the end of FY 2023 and have been submitted to NELHA for review and comments.

Once NELHA's corrections and revisions have been incorporated, the set will be at 90% completion: meaning that the design meets NELHA's expectations, and the documents have received NELHA's final approval and are ready to be submitted to the utilities and permitting agencies for issuance of the building permits.

NELHA will continue ongoing effots to secure Capital Expenditure funds.

By contrast, the draft 90% plan-set was accompanied by an updated construction cost estimate. This update shows the total cost for construction of the Visitor Center and Innovation Center as $1M and $20M respectively, inclusive of 14% combined "Estimating Contingency" and "Construction Cost Escalation" to Jan. 2024.

NELHA staff will complete their review of the draft plan submittal by late 2023. Once NELHA's corrections and revisions have been incorporated into the design and specification documents, the architect's contract will be complete and will be closed out. NELHA will continue ongoing efforts to secure Capital Expenditure funds for the construction of these facilities.

2. Explore alternatives and develop a plan for the long-term management of the Wawaloli Beach Park including a sub-lease to the County of Hawaii.

RESULTS:

NELHA had several discussions with the County as well as the NELHA Cultural Hui, and they suggested that we review alternative community-based models such as Ho'okena Beach Park.

3. Complete purchase of new facilities for Mauka Research Campus; develop a conceptual plan for leasing of facilities; initiate construction upgrades; secure new tenants; and close out FEMA grant.

RESULTS:

Completed procurement and negotiations for the purchase of the old Destiny Deep Seawater LLC building and improvements on the 3.3A parcel. The final price and purchase for the approximate 30,000 sq. building and improvements was $4.75M.

This purchase was approved by the NELHA Board of Directors and FEMA. NELHA has entered into a short-term revocable permit for leasing a portion of the outside space and obtained Board approval in principle for a signification portion of the building.

We continue to discuss to the lease of the remainder with several interested parties. The FEMA grant was closed out and we have received the full amount of the grant award. We are still working on completing the necessary forms for the reimbursement of the direct administrative costs.

4. Continue efforts for an exploratory well for new potable water resources for NELHA. Obtain final permits required for construction and begin construction of well in conjunction with HHFDC and DHHL. Secure new funding if necessary.

RESULTS:

We have met with DLNR Chair to explain our position and discuss alternative pathways forward to avoid a contested case hearing as filed by our partner (HHFDC) on this project. As such, a more detailed plan for monitoring potential impacts and alternative proposal is being formulated. We had several meetings with State agencies, County officials, Aha Moku and other members of the community.

We plan to also meet with other stakeholders including private developers in West Hawaii, community organizations, and Federal agencies to achieve consensus before bringing the permit conditions back to CWRM for reconsideration.

5. Complete offshore freshwater survey.

RESULTS:

NELHA received $500,000 to complete, using non-invasive, non-destructive, and transient geophysical imaging techniques, to generate a map of the electrical resistivity of rock formations beneath the seafloor along a narrow 9-mile stretch of the west Hawaii Island coastline, approximately 1,000 ft. offshore. The purpose of this work is to identify and map reservoirs of submarine freshwater offshore of the Hualalai volcano on the Island of Hawaii.

These funds were allotted, and we have been in discussions with the University of Hawaii regarding the scope and timeline for the offshore survey. We now have a final draft scope of work and are in discussions with various State and Federal agencies to obtain the necessary permits. The survey work is planned for Spring 2024 after the winter high surf season.

6. Initiate update and secure consultant for Environmental Impact Statement for HOST Park.

RESULTS:

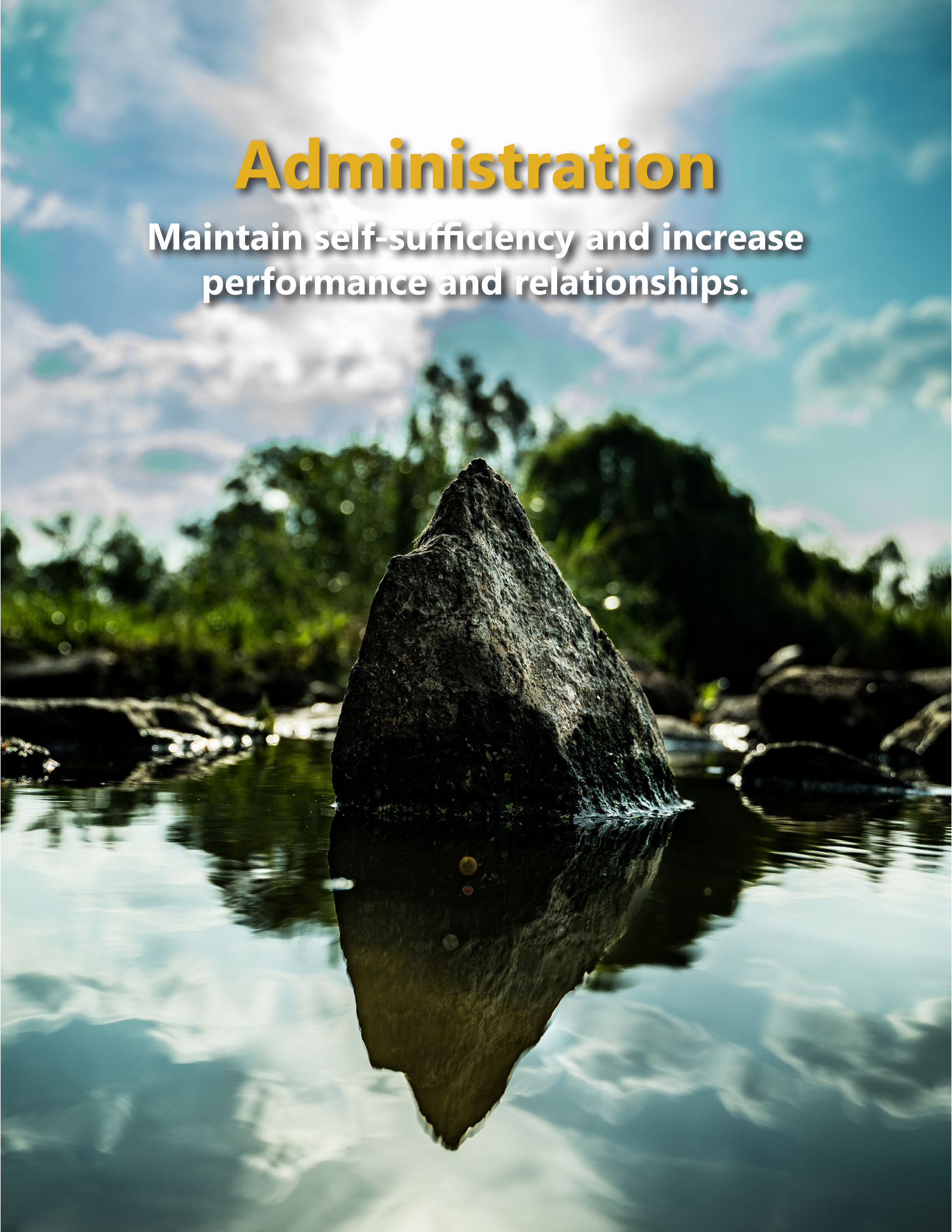
We have determined that it is appropriate to complete the Master Plan update and the EIS update at the same time. We are developing the scope of work and reviewing results from professional services solicitation.

7. Continue efforts to enable the development and permitting of an offshore research corridor to facilitate demonstration projects in new ocean technologies to address food security, energy security (including OTEC), ocean technologies, and conservation and climate mitigation.

RESULTS:

Submitted CIP request for $1.5M in Governor Green's Administration budget request and successfully passed the Legislature. The budget bill signed by the Governor in June with $1.5M for the offshore research corridor EIS. We are developing the scope of work and reviewing results from professional services solicitation.

Photo Credit Karen Loudon Photography Feb. 2015



Administration

Maintain self-sufficiency and increase performance and relationships.

Overall Leadership:

• Continued to formulate and effectively communicate a motivating vision, goals, and strategic direction for NELHA.

• Provided the Board with periodic "flash updates" to events could have an impact on overall policy.

• Ensured that adequate resources are provided to the NELHA team for training and experience to grow, think strategically and act within the responsibilities of their job descriptions.

• Built trust with the NELHA team and challenge them to achieve and see the impact of their efforts to increase staff morale, productivity, learning new skills and retention.

• Continued to focus on worker safety and decreasing the vulnerability of the NELHA team to the negative impacts of the pandemic.

Adminstration

GOALS & KEY PROJECTS
FISCAL YEAR 2022

1. Continue to increase revenue streams within the NELHA Board-approved business plan through continued efforts to maintain occupancy in Research Campus, vacant lands in HOST Park and additional customers for WQL work. Target an overall increase of 4% over FY 2020. Increase utilization of under-utilized assets such as the Gateway Center.

RESULTS:

Discounting for insurance payments revenue was flat for FY 2022 and continues to be challenging. We are also closely monitoring expenditures. We continued to see significant new interest in HOST Park in FY 2022, we welcomed ten new tenants and reviewed 24 potential new projects with some NELHA staff time investment, nine potential projects with significant NELHA staff time investment, and three promising long-term projects.

This activity has led to the Research Campus seeing occupancy of almost 100% in some months and has accelerated our effort to fast-track the development of new research campus space. Importantly, we were successful in attracting a new business for the leasing of the Gateway Center. The Gateway Center was leased to the Friends of NELHA for use as a visitor center but was being underutilized. The new lease will provide for an additional revenue of more than $120,000 annually.

We also completed an update of the published leasing policy rates, last updated in 2016, which were based on June 10, 2010, professional appraisal by ACM Consultants, Inc. While many of the new leases have an automatic annual CPI adjustment, the "base rate" for new leases needed to be adjusted based on inflation. The Board approved these new rates in June 2022 which were generally in the 5% range, except for the open space rate in the Research Campus, which was increased by 20%.

THANK YOU GEORGIE: Governor David Ige makes a special appearance along with NELHA staff to say aloha and mahalo to Georgie Espinueva who has worked with the State of Hawaii for over 25 years.

NELHA Archive Photo June 2022

Office Manager Jerrae Miranda received recognition for her 10 years of service with Board President Bill Mielcke and Executive Director Greg Barbour by her side.

2. Continue to improve landlord/tenant relationships. Conduct annual satisfaction surveys of tenants at NELHA and make improvements to increase satisfaction where necessary. Produce semi-annual newsletter.

RESULTS:

We continued to produce semiannual newsletters in FY 2022. Both newsletters (Summer 2021 and Winter 2021/2022) are available online and were well received.

The annual satisfaction survey was postponed to FY 2023.

3. Continue to work with and support DBEDT's Economic Innovation Team regarding the formulation of a new course for a sustainable economic future for Hawaii especially in light of the Great Pandemic of 2020.

RESULTS:

We worked closely with the DBEDT Economic Innovation Team and participated in an extensive number of Zoom meetings with the team and other DBEDT members. The meetings were essential in mapping DBEDT 2.0 and the department's role in the State's efforts regarding new initiatives. This exercise resulted in a DBEDT omnibus funding bill.

4. Develop the 2022 Legislative Agenda and draft legislation if necessary.

RESULTS:

We proposed no new legislation for the FY 2022 session. There were no adjustments to our requested special fund ceiling in the Supplemental Appropriations Act of 2022 and we successfully requested an additional $2M in CIP funding for an update of our EIS and an underwater survey to identify potential offshore freshwater seeps.

We also testified numerous times about several bills relating to expediting the potable water well-permitting process, changes to NELHA enabling legislation, and a DBEDT omnibus appropriations measure that included additional funding for NELHA. All these measures were deferred.

5. Global Pandemic – Continue to take steps to mitigate negative impacts on NELHA operations and clients including:

1) Maintaining increased communication with NELHA clients and demand for their products;
2) Evaluating ways to assist smaller companies when warranted and especially those that are severely impacted;
3) Formulate additional steps to increase security in HOST Park by managing access during periods when the State and County issue proclamations to ban or limit social gatherings especially at Wawaloli Beach Park and along the shoreline;
4) Start "work from home" for NELHA employees when warranted;
5) Remain vigilant regarding impacts on the health of NELHA employees to ensure the use of personal protective equipment, sanitizers and social distancing; and,
6) Maintain use of virtual meetings with clients and for NELHA Board of Director meetings.

RESULTS:

We continued to operate throughout the fiscal year with all staff reporting to work at HOST Park daily with no "work from home remotely" approvals.

Given, that NELHA employees are in four separate buildings, and many have separate offices, we purchased significant supplies of disinfectant, other sanitizer supplies, masks, and temperature devices and we made extensive use of Zoom for meetings. In addition, 95% of NELHA employees had received a COVID vaccination.

We were able to make it through the year with only two positive cases of COVID-19 for NELHA employees and there was no spread by those infected to other NELHA employees. HOST Park and Wawaloli Beach Park remained open to the public, and nightly fishing permits were provided daily.

It is important to note that during the pandemic and resultant times of economic uncertainty, we have seen that the sectors we target are somewhat resilient to those issues and can stand up to economic weaknesses.

In FY 2022, there was only one closure of a NELHA business, and we welcomed ten new clients to HOST Park. We consider that this is a strong indication of our success in providing adequate support to our clients and the strength of our operations.

About 95% of NELHA staff has been vaccinated against COVID-19.

6. Update Organization Chart and Position Descriptions

RESULTS:

Completed an extensive review of the formal approved organizational structure of NELHA which had not been completed in over ten years. The DBEDT Director approved our request to initiate a staffing reorganization plan in March 2022.

The new structure makes the agency more "vertical" and adds a new "managerial level" to improve workflow, operational efficiencies, and effectiveness by reorganizing the authority.

The previously-approved functional statement was structured into five sections, and we streamlined the structure into only four sections.

In addition, we redescribed several position descriptions and all are now up to date except for two vacant positions that will be redescribed and filled next fiscal year. The new structure did not require additional resources to implement the reorganization no new positions, space, or equipment was required.

The BOD approved this reorganization in April 2022 and the final documents were sent to DBEDT Director in June 2022 for final approval.

SHOW ME THE MONEY: Sponsored by the U.S. Dept. of Energy and administered by the National Renewable Energy Laboratory, intrepid innovators and inventors were encouraged to sign up for the American Made Challenge Solar Prize where NELHA served as a gold-level member and accelerator connector. Prize monies would top at $4.6M, with NELHA getting a bit of action for assisting support to winning entrants.

NELHA Archive Photo Nov. 2021

HOLIDAY CHEER: NELHA staff enjoyed a cozy and intimate annual holiday luncheon.
NELHA Archive Photo Dec. 2022

Administration

GOALS & KEY PROJECTS
FISCAL YEAR 2023

1. Continue to increase revenue streams within the NELHA Board-approved business plan through continued efforts to maintain occupancy in Makai Research Campus and vacant lands in HOST Park. Target an overall increase of 25% of total revenue over FY 2022.

RESULTS:

With the Makai research campus at close to full capacity and the Hale Iako incubator offices completely leased out, NELHA continued to work on extending the Makai campus and purchased the Mauka Research Campus. Revenue for the Makai Research Campus increased by $125,000 or almost 30%.

Overall revenue increased by 16%. While a few smaller projects have terminated, other small projects have replaced them leading to a stable client base. NELHA continues to receive and entertain new project proposals. It is important to note that over the past two years, we have seen significant construction and leasing activity.

With 13 projects either in the construction phase, new lease executed, or lease approval in principle consisting of over 70 acres during the pandemic and times of economic uncertainty, we have seen that the sectors we target are somewhat resilient to those issues and can stand up to economic weaknesses.

At the same time, leveraging the EDA grant mentioned above, NELHA has entered into a contract with a Big Island-based firm to produce an online tour including a set of videos to attract new clients to HOST Park.

2. With exact same goals as FY 2022, continue to improve landlord/tenant relationships. Conduct annual satisfaction surveys of tenants at NELHA and make improvements to increase satisfaction where necessary. Produce semi-annual newsletter.


NELHA Archive Photo Oct. 2022

RESULTS:

Completed 2022/2023 satisfaction survey in January 2023 which consisted of 11 questions. We received a response rate of 47% (23 of 49 businesses). Overall results we good with highlights including: a) over 85% satisfied with our services; b) 70% responded that our services met their needs either very well or extremely well; c) over 70% responded that the quality of the seawater is high or very high; d) 90% said lease rates were fair or very fair; and, e) 75% said seawater rates were fair or very fair.

The open-ended question did identify, for the first time, inconsistent water quality and increased biofouling. This issue expanded to several other tenants later in the Spring of 2023 and we plan to address this issue in more detail in 2024. The semi-annual newsletter was produced twice.

3. Work with Ironman Triathlon to ensure access for businesses to HOST Park during the two-day race. Complete a survey of businesses to assess impact.

RESULTS:

Coming out of the pandemic, the Ironman race in October of 2022 included two days of racing, one of which was on a weekday. NELHA worked closely with Ironman officials to successfully manage impacts on HOST Park clients. NELHA also followed up with an assessment of the impact.

As a result of this and other community input, Ironman will return to a single Saturday women's only race in October 2023, alternating between men's and women's races each year.

4. Work with UH Hilo, UH Community College at Palamanui and local High Schools to develop familiarization tours of businesses at HOST Park to assist them in designing workforce development pathways for future employees.

RESULTS:

NELHA initiated a "pathways" workforce development program in FY 2023. At the UH level, we met with the UH-Hilo Chancellor and key administration officials and professors. This resulted in the arrangement for 13 individuals from UH-Hilo to visit NELHA in August to learn more about the kinds of jobs that aquaculture companies are looking for over the next ten years. Five businesses were visited during the day-long familiarization trip.

CLOSING THE GAP: HOST Park clients and community members learn how Good Jobs Hawaii is working with businesses, educators and community partners to meet their needs for quality, skilled employees. A $35 million workforce development initiative, Good Jobs Hawaii also delved into what skills are needed in the aquaculture sector.

NELHA Archive Photo May 2023

At the Department of Education level, we spoke with a significant majority of schools in West Hawaii. Most preferred to wait until Fall 2023 for further engagement.

Arranging for travel to and from NELHA with teachers, students and parents is problematic. We created a tour agenda and activity book for students.

In May, NELHA hosted a meeting with Good Jobs Hawaii (GJHI) and HOST Park clients and community members learned about Good Jobs' $35 million workforce development initiative which aims to fill education gaps and provide support for internships and programs in select sectors including food security and ocean technology. NELHA-based businesses also provided input and feedback on what skills are needed to meet their company objectives.

Of particular importance was a discussion regarding an aquaculture certificate being developed by Windward CC and the Palamanui Campus is most likely to be involved. Windward CC plans to move forward with an online class in the Fall Semester 2023. Per GJHI, funding a navigator dedicated to aquaculture was not a part of the scope of any of the GJHI grants though it seems like a great idea that maybe one of the specific aquaculture grants should explore.

Met with the CEO of ClimbHI (https://climbhi.org) last month and am part of their ClimbHI Bridge program which connects Hawaii schools to businesses and other organizations. We had four interns in the Spring-Summer 2023.

5. Develop 2023 Legislative Agenda and draft legislation.

RESULTS:

NELHA monitored over 35 bills during the session. A majority of the bills concerned aquaculture and rules and regulations for Board meetings. One bill had a direct impact on the NELHA statutes but was deferred.

NELHA testified on seven of these measures of which one was the budget bill. NELHA was successful in securing an additional $3.4M in CIP funds.

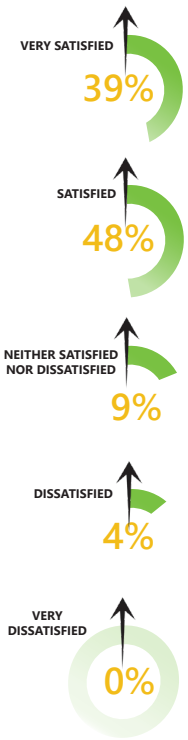
NELHA client survey 2022 / 2023

RESULTS FROM THE NELHA CUSTOMER SERVICE SATISFACTION SURVEY

(50% Response Rate Overall 23 of 49)

Q1 How satisfied are you with the service received from NELHA at HOST Park?

23 respondents answered.

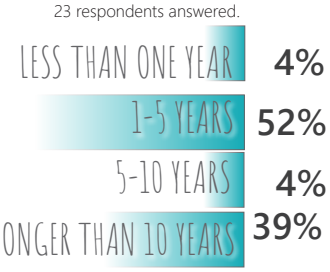


Q2 Which of the following words would you use to describe our services? Select all that apply.

23 respondents answered.

Q3 How long have you been at HOST Park?

23 respondents answered.



Q4 How well do our services meet your needs?

23 respondents answered.

35% responded "EXTREMELY WELL"

35% said "VERY WELL"

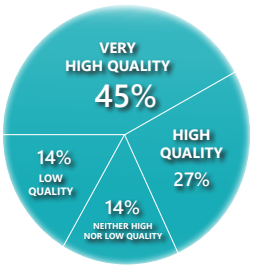
22% said "SOMEWHAT WELL"

9% said "NOT SO WELL"

0% said "NOT WELL AT ALL"

Q5 How would you rate the quality of the seawater you receive?

22 respondents answered. 1 skipped.



Q6 Are there any new additional services you would like to see us provide?

7 respondents answered. 16 skipped.

"A PIER AND BOAT LAUNCH TO SUPPORT TESTING AND IMPROVE ACCESS TO OPEN WATER."

"1.) PERHAPS AN OPPORTUNITY FOR US TO WASH OUR WORK VEHICLES ON-SITE AND PAY FOR EXTRA WATER USED. 2.) A BUSINESS PARK COORDINATED OFFICE CLEANING SERVICE."

"MORE RESOURCES FOR MAINTENANCE"

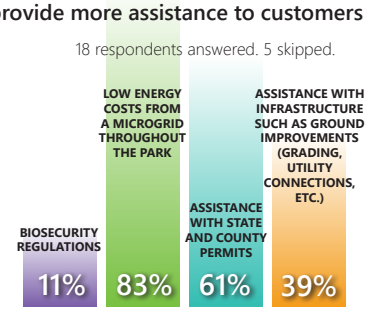
"Better communication with tenants."

"Key supply negotiation with monopolies to lower costs and increase reliability for CO2 (Airgas) and electricity (HECO)."

"Free ice cream."

Q7 What issues would you like to see NELHA provide more assistance to customers here?

18 respondents answered. 5 skipped.



Q8 How fair or unfair are the lease rate fees charged by NELHA?

21 respondents answered. 2 skipped.

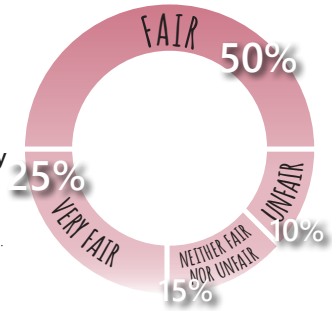
33% VERY FAIR

57% FAIR

10% UNFAIR

Q9 How fair or unfair are the fees charged for seawater by NELHA?

20 respondents answered. 3 skipped.



Q10 How easy is it to understand the information on our website?

22 respondents answered. 1 skipped.

Q11 Do you have any other comments, questions or concerns?

7 respondents answered. 16 skipped.

"THERE SEEMS TO BE A NEED FOR MORE SPACE IN THE PARK. THERE ALSO SEEMS TO BE A LOT OF SPACE THAT IS JUST BEING SAT ON BY TENANTS AND NOT UTILIZED. PERHAPS AN ACTIVITY CLAUSE COULD BE ADDED TO FUTURE LEASE TERMS SO UNUSED AREAS CAN BECOME AVAILABLE TO PEOPLE WHO WILL USE IT."

"WATER QUALITY IS INCONSISTENT AND A LOT OF BIOFUELING. PROVIDE CENTRALIZED WATER QUALITY MONITORING FOR CHEMICAL AND BIOLOGICAL ANALYSIS FOR THE WHOLE PARK."

"OVERALL, I BELIEVE NELHA IS A VERY UNIQUE LOCATION WHERE WE CAN PERFORM TESTING ON LAND THAT WOULD NORMALLY REQUIRE USE OF RESEARCH VESSELS IN OPEN WATER."

"The team at NELHA is simply wonderful!"

"None."

"We have always been pleasantly surprised with and appreciative of how responsive your team have been when we've had issues."

"NO IRONMAN."

NATURAL ENERGY LABORATORY OF HAWAII AUTHORITY
FINANCIAL STATEMENT - FISCAL YEAR 2022

(Fiscal Year - July 1 to June 30)

	Fiscal Year 2022
REVENUES	
Land Use Fees	2,128,721.94
Seawater Royalties	33,075.40
Reimbursables	1,853,179.43
Interest Received	94,944.02
Other	336,628.67
Percentage Rent	250,745.10
Subtotal	4,697,294.56
EXPENDITURES	
Salaries	1,877,928.92
Operations	2,315,040.83
OHA (Ceded Lands Transfer)	475,472.98
Subtotal	4,668,442.73
FINANCIAL POSITION	
Special Fund Cash Balance (July 1)	994,610.03
Prior Year Unrequired claims	-
Prior Year Transfers	-
Special Fund Revenues	4,697,294.56
Subtotal	5,691,904.59
Special Fund Expenditures	4,142,803.78
OHA (Ceeded Lands Transfer)	475,472.98
Encumbrances	400,548.04
Special Fund Cash Balance	**673,079.79**

Note: All data as end of fiscal year (June 30) unless otherwise noted.

NATURAL ENERGY LABORATORY OF HAWAII AUTHORITY
FINANCIAL STATEMENT - FISCAL YEAR 2023

(Fiscal Year - July 1 to June 30)

	Fiscal Year 2023
REVENUES	
Land Use Fees	2,329,622.69
Seawater Royalties	29,544.62
Reimbursables	2,538,846.56
Interest Received	103,278.85
Other	424,107.93
Percentage Rent	25,768.93
Subtotal	5,451,169.58
EXPENDITURES	
Salaries	1,926,304.53
Operations	2,548,369.67
OHA (Ceeded Lands Transfer)	469,404.96
Subtotal	4,944,079.16
FINANCIAL POSITION	
Special Fund Cash Balance (July 1)	663,500.00
Prior Year Unrequired claims	-
Prior Year Transfers	38,071.14
Special Fund Revenues	5,451,169.58
Subtotal	6,152,740.72
Special Fund Expenditures	4,474,674.20
OHA (Ceeded Lands Transfer)	469,404.96
Encumbrances	270,183.18
Special Fund Cash Balance	**938,478.38**

Note: All data as end of fiscal year (June 30) unless otherwise noted.

NELHA Board of Directors

2022-2023

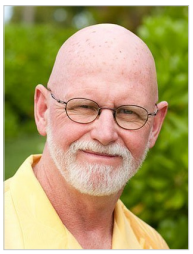
Cyd Miyashiro
CHAIR/VICE-CHAIR
GOV. APPOINTEE
American Savings Bank
FY 2022 & 2023

William F. Mielcke
CHAIR/VICE-CHAIR
GOV. APPOINTEE
Mauna Kea Properties
FY 2022

Noelani Kalipi
VICE-CHAIR/
GOV. APPOINTEE
Kalipi Enterprises
FY 2022 & 2023

Alan Hilton
RAC CHAIR
Consultant
FY 2022 & 2023

Dr. Phil Bossert
RAC SECRETARY
Hawaii Association of Independent Schools
FY 2022 & 2023



Gordon Bruce
GOV. APPOINTEE
Cyber Security Consultant
FY 2023

Dr. Vassilis Syrmos
University of Hawaii
FY 2022 & 2023

Chung Chang
DBEDT
FY 2022

Scott Glenn
Hawaii State Energy Office
FY 2023

Robert Masuda
DLNR
FY 2022

Dick Jones
TENANT REP.
Blue Ocean Mariculture

Neil Sims
TENANT REP.
Ocean Era, Inc.
FY 2022 & 2023

Douglass Adams
County of Hawaii
FY 2022 & 2023

Bernice Glenn
HTDC
FY 2022

Russell Tsuji
DLNR
FY 2023

Natural Energy of Hawaii Authority (NELHA) is to develop and diversify the Hawaii economy by providing resources and facilities for energy and ocean-related research, education, and commercial activities in an environmentally sound and culturally sensitive manner.

ALOHA 'OE: A sad farewell, NELHA holds a potluck celebration for three employees: Jerrae Miranda, Dean Towle and Tony Mitchell who will retire at the end of the year. Retired Sheryll Kaniho and Jan War join current NELHA staff to mahalo Jerrae, Dean and Tony.

NELHA Archive Photo Nov. 2023

NELHA Team

NELHA staff comprises a small crew of 17 employees, each with unique skills and qualifications needed to oversee HOST Park. Most employees have been here for over 10 years or more - a testament of employee satisfaction at NELHA.

Incumbent	Position Title
Gregory Barbour	Executive Director
Bryan Babbitt	Engineer Projects Coordinator
Brian Berg	Utility Electrician
Chad Debina	General Laborer
Faustine Edge	Administrative Assistant
Alex Leonard	Chief Projects Manager
Pamela Madden	Water Quality Lab Manager
Bryce Matsuoka	Groundskeeper and Maintenance Worker
Steve Midgley	Electrician
Jerrae Miranda	Business Manager
Tony Mitchell	Maintenance Manager
Rae Nguyen	Marketing and Leasing Specialist
Keith Olson	Chief Operations and Science Officer
Jennifer Rasmussen	Accounting Clerk
Laurence Sombardier	Deputy Director
Kevin Tapley	Industrial Maintenance Mechanic
Dean Towle	Operations Supervisor and Engineer

In Memoriam

Remembering those who made an impact at HOST Park

Joseph Newell Wilson

Founder of Kona Cold Lobsters
June 16, 1945 to May 18, 2022

NOT FORGOTTEN: Joseph "Joe" Wilson, along with brother Phil, started Kona Cold Lobsters, one of the first successful aquaculture ventures at HOST Park.

Passionate and knowledgeable, Joe was possibly best known ambassador for NELHA. He had much integrity and was a very generous man. He embodied the aloha spirit in every relationship and every aspect in his life.

Appendix

History of Major Events

1974 - 1979

1974

Natural Energy Laboratory of Hawaii, operated by the University of Hawaii, was established as a response to the first oil crisis.

1979

Mini-OTEC was anchored offshore of Keahole Point, demonstrating the world's first production of net electrical power via closed-cycle OTEC.

1980 - 1981

1980

Laboratory facilities and its first pipeline to draw deep seawater from 2,000 ft. and surface seawater from 45 ft. depths were completed.

1981

Shore-based OTEC research began with a project testing biofouling and corrosion countermeasures for the closed cycle OTEC process.

1984 - 1985

1984

Legislation authorized commercial activities, allowing the Laboratory to host new business ventures

1985

Legislature authorizes NELH to assume management responsibility of the Puna Geothermal Facility to NELHA. Facility consists of a 3 mW electric power plant and the Noi'i O Puna Research Center.

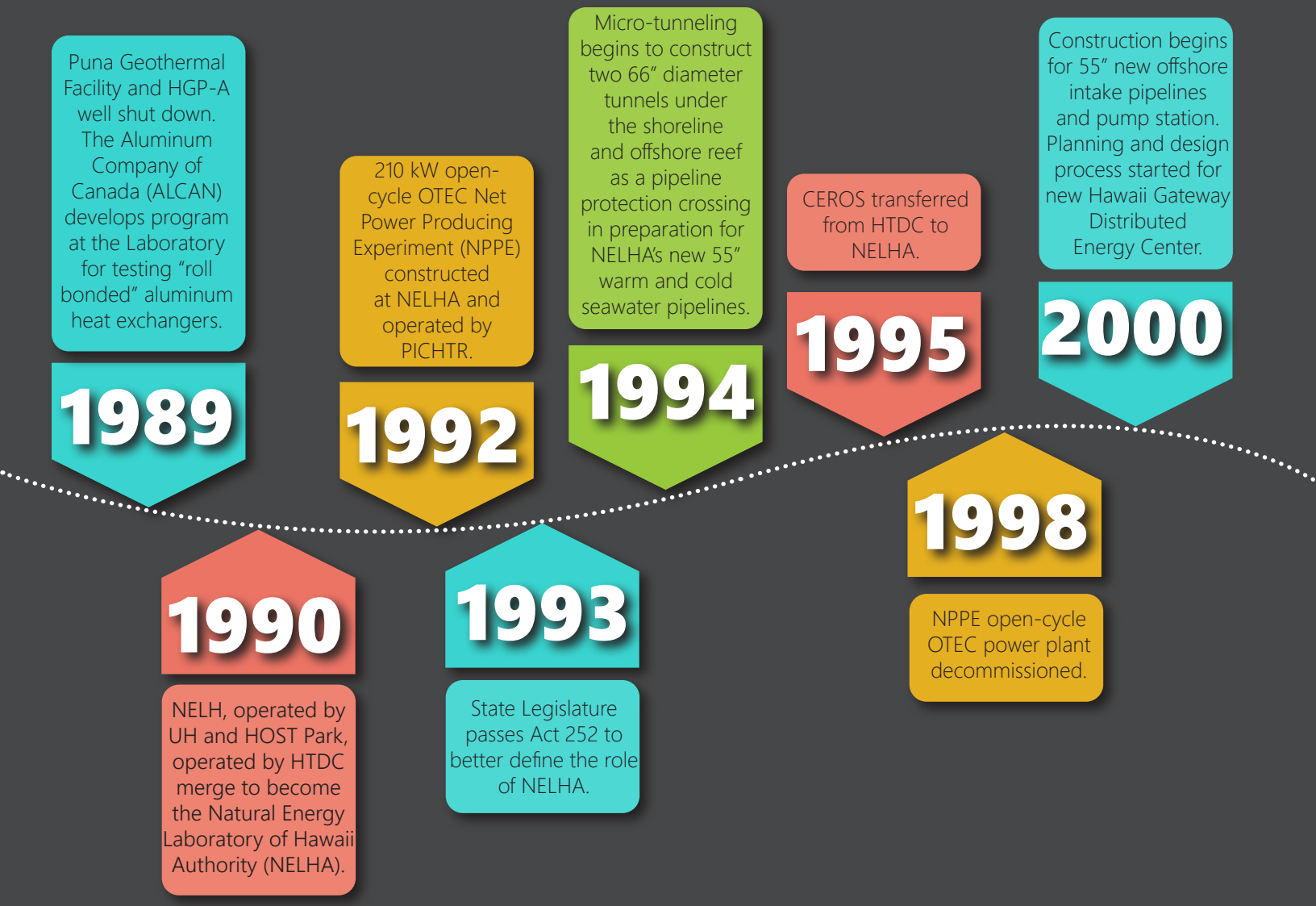
1986 - 1987

1986

HOST Park was created on 500+ acres and operated by HTDC. US DOE and HOST Park combined resources to install 40" deep and 28" surface seawater system at Keahole Point. Lab building AC system converted to deep seawater cooling. Legislature appropriates funds for 18" deep seawater pipeline.

1987

Heat and Mass Transfer Scoping Test Apparatus (HMTSTA) open-cycle OTEC test tower constructed and operated by Pacific International Center for High Technology Research (PICHTR).



Appendix

History of Major Events

1989 - 2000

Appendix

History of Major Events

2002 - 2007

2002

Successful deployment of 55" pipeline offshore and construction of initial phase of onshore pump station using specially designed fiberglass reinforced intake cannisters. First deep seawater desalination project begins for bottled drinking water.

2003

NELHA tenant count reaches 34. Nonprofit "Friends of NELHA" formed to assume basic public relations and outreach functions for NELHA.

2004

Construction of Hawaii Gateway Distributed Energy Center completed.

2005

55" warm and cold seawater pump station and distribution pipelines completed.

2006

Foreign Trade Zone status granted by US Dept. of Commerce. Keahole Solar Power LLC begins construction of solar thermal research and demonstration facility. There are 5 leases to desalinize deep seawater to produce boutique drinking water.

2007

Cellana, in partnership with Royal Dutch Shell, begins construction of a 6-acre micro-algae to biofuels research center.

Appendix

History of Major Events

20011 - 2015

2011

Makai Ocean Engineering completes construction of corrosion lab and heat exchanger test tower to investigate the use of aluminum alloys for OTEC.

2012

UH Economic Research Organization (UHERO) completes first independent economic impact study regarding HOST Park. Results indicate economic impact and job creation was much higher than previously thought and at almost $90 million annually and 600 jobs. Completed update of Master Plan which began in 2009 and Strategic Plan was updated. Completed program audit with State auditor which began in 2010. Federal grants totaling almost $3.5 million received for renovation of main administration building and micro-grid infrastructure for the Research Campus. Received $1.8M in CIP funds for deep seawater pipeline repairs.

2013

HOST Park economic impact surges by 40 percent since 2010. Received $2.3M in CIP funds for seawater system upgrades and interconnection of seawater between two systems. Completed deep seawater pipeline repair ($5M) to extend life of pipeline by 15 years. Received $10M for new road construction. Over $30 million in private/public projects underway.

2014

NELHA receives $2.5 million in CIP funding for new exploratory water well. National Lab relationships strengthened. Completed first Vision paper for NELHA to define specific strategic target areas for future growth of HOST Park. NELHA received the 2014 DBEDT "Team of the Year" award for the Deeps Seawater Pipeline Repair project. Further developed strategic partnerships with Sandia National Laboratory, Lawrence Berkeley National Laboratory, Pacific Northwest National Laboratory, and the National Renewable Energy Laboratory. Entered into a MOU with the County of Hawaii, and Hawaii Electric Light Company to develop and energy storage system test bed at HOST Park. Completely revamped the NELHA website.

2015

NELHA begins construction of numerous projects including office incubator, 28-inch cross connector surface seawater pipeline to connect the north and south seawater systems and buildout of the SCADA system to monitor real-time use of seawater and electrical consumption.

Appendix

History of Major Events

2016 - 2019

2016

NELHA completed significant improvements to the Research Campus including of the main administrative building in the Research Campus and turned it into a 14,000 s.f. blue technology and advance energy incubator building with 17 offices. Completed major revision to the NELHA Aquatic Species Health Management Program which includes NELHA biosecurity polices and guidelines. Released RFI for a prime site for commercial development in the Ocean CenterPiece development area. Organized a 2-day national conference for energy storage systems. Completed a detailed archeological survey of the entire upper half of HOST Park to identify any unknown sites.

2017

NELHA begins major projects to open up the "Ocean CenterPiece" 80-acre economic driver including a $10M road construction project and efforts to develop an exploratory well as a new freshwater source. Began formulating the concept for a Hawaii Center for Aquaculture Sustainability at HOST Park and hosted Statewide aquaculture industry summit. Began extensive renovation of Hale Kaa which will complete renovation of the 6-acre research campus which included renovation of 9 buildings, covered storage, upgrades to the electrical system, wastewater system, design for new fire suppression and hydrants, walkways, and security enhancements in the research campus over in the past five years. Signed lease with Hawaii Natural Energy Institute to develop a hydrogen production, storage, and filling station in the research campus. Received the 2017 Mahalo Award from the Hawaii Community College at Palamanui and the 2017 Community Service Award from ThinkTech Hawaii.

2018

Received $1.928M grant from the US Department of Energy for solar desalination demonstration project. Received $4.9M in CIP funds for upgrades to seawater system. Kicked off Aquaculture Accelerator project with strategic partnership with Hawaii Strategic Development Corporation, University of Hawaii, and UH Ventures LLC to undertake a concerted and collaborative effort to raise Hawai'i's global visibility in marine aquaculture and to capitalize on the commercial opportunities available globally. Held second national conference on energy storage systems. Received $142,500 from the State Energy Office to develop a 10-year plan to increase renewable energy for NELHA's seawater system and develop microgrids. Completed all studies and obtained all approvals for exploratory water well development except for a final permit from the Commission on Water Resource Management.

2019

UH, HTDC and NELHA selected HATCH as the best candidate to operate the Hawai'i aquaculture accelerator and run the $8.4M investment fund and completes first cohort of 13 companies. Received $275,000 in grant funds from EDA for this project. Notified by the Korean Institute of Energy Technology Evaluation and Planning that we were selected as a participating organization for a grant award of $1.73M USD for microgrid development at the 55" pumpstation. Signed a $1.85M agreement with Encored was executed to construct the microgrid at the 55" pumpstation. SCADA system expanded to monitor in real-time 85% of total seawater flows with 116 devices online. Completed installation of 178kW of additional solar panels in the Research Campus. Completed installation of a 100kW/400kWh advanced flow energy storage system at the Gateway Center for demonstration purposes. Executed agreement with Trevi Systems as the main contractor for the solar desalination project. Completed tenant satisfaction survey with results showing 94% very satisfied or satisfied with NELHA services and 86% indicated that NELHA services meet their needs very well or extremely well. Completed damage assessments from the buildings destroyed by the Kilauea volcanic eruption and submitted request to FEMA and insurance companies for $7.6M. Resumed semi-annual newsletters.

Appendix

History of Major Events

2020 - 2023

2020

Successfully navigated the 3-month lockdown in the March – May timeframe due to the COVID-19 pandemic. Maintained strong contact with all tenants and no issues were reported with traffic control during the lockdown. NELHA staff resumed 40-hour work hours on site on June 1 with a strong focus on adequate safety precautions and ample sanitary gear. No positive cases of COVID-19 were experienced by NELHA staff in 2020. FEMA approved NELHA request for $3.447M for damage to the Puna buildings and funds were obligated. Successfully secured, after very extensive negotiations, $3M from the 11 insurance companies involved in the Puna damage. Began procurement to select a planning and design firm for the expansion of the research campus which is at 100% occupancy, using the funds from the insurance companies.

2021

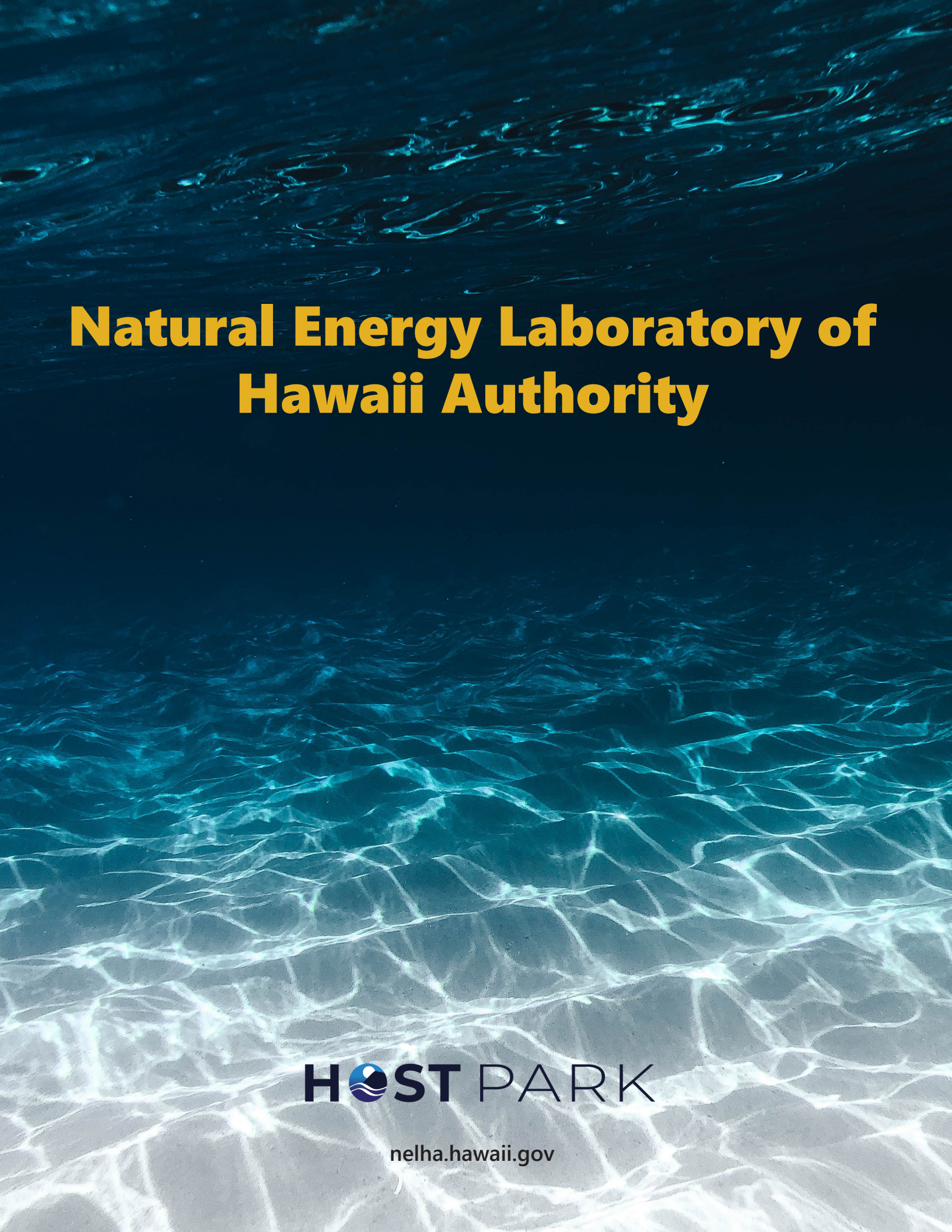
Continued to make progress on energy efficiency for the seawater system with a 4.43% increase in efficiency for the fiscal year ending June 30, 2021. With increased automation overall efficiency has increased by 15% over the past 5 years. Completed 10-year road map for renewable energy and microgrid development in HOST Park. Consultants selected for the plans and design of strategies to address the long-term status of the abandoned deep seawater pipelines by Ocean Farms Hawaii in the 1990s. Completed design and all approvals for the microgrid project except for a building permit from the County of Hawaii. Completed the third and final year of the pilot aquaculture accelerator project successfully and obtained a $1.8M grant from the US EDA to extend the accelerator for an additional four years. Began master planning and design for the expansion of the research campus towards a new 9-acre Innovation Village. Master plans were completed and building design plans are at 60% completion. Continued to work on entitlements and environmental assessment for the Innovation Village. Completed updated vision for HOST Park to lead development of the ocean economy in Hawaii with a strong focus on ocean energy, food security (aquaculture), ocean technology and ocean conservation.

2022

Despite the pandemic we successfully pumped over eight billion gallons of seawater without interruption to the over 50 businesses at HOST Park during the year. We saw the number of new businesses continue to grow and we welcomed ten new clients to HOST Park and there was only one closure of a NELHA business. This activity has led to the Research Campus seeing occupancy of almost 100 percent in some months and has accelerated our effort to fast-track the development of new research campus space. We were also successful in attracting a new business for the leasing of the Gateway Center. Received $2.0M in CIP funding including $1.5M for Comprehensive EIS update for onshore lands and $500,000 offshore freshwater seep. Completed an extensive review of the formal approved organizational structure of NELHA which had not been completed in over 10 years. The new structure makes the agency more "vertical" and added a new "managerial level" to improve workflow, operational efficiencies, and effectiveness by reorganizing the authority.

2023

Completed extensive work on the new 55" Pump Station Microgrid Project including completion of the initial phase of PV and battery system testing. NELHA's contractor launched its aquaculture accelerator 5.0 cohort. Received CIP funding request for $3.4M seawater system upgrades and complete an EIS to develop and offshore research corridor. Completed procurement and negotiations for purchase of the old Destiny Deep Seawater LLC building and improvements on the 3.3A parcel. Final price and purchase for the approximate 30,000 sq.ft. building and improvements was $4.75M. We initiated study using marine controlled source electromagnetic (CSEM) methods with researchers from the University of Hawaii which aims to identify and pinpoint the location of pockets of submarine freshwater reservoirs 100's and 1'000's of feet below the seafloor offshore. NELHA initiated a "pathways" workforce development with the and high schools.



Natural Energy Laboratory of Hawaii Authority

HOST PARK

nelha.hawaii.gov