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DEPUTY DIRECTOR

DEPARTMENT OF BUSINESS, ECONOMIC DEVELOPMENT & TOURISM

KA ʻOIHANA HOʻOMOHALA PĀʻOIHANA, ʻIMI WAIWAI A HOʻOMĀKAʻIKAʻI

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December 20, 2024

The Honorable Ronald D. Kouchi,
President and Members
of the Senate
Thirty-Third State Legislature
State Capitol, Room 409
Honolulu, Hawaii 96813

The Honorable Nadine K. Nakamura,
Speaker and Members of the
House of Representatives
Thirty-Third State Legislature
State Capitol, Room 431
Honolulu, Hawaii 96813

Dear President Kouchi, Speaker Nakamura, and Members of the Legislature:

For your information and consideration, I am transmitting a copy of the Natural Energy Laboratory of Hawaii Authority Annual Report 2024, as required by Hawaii Revised Statutes, Chapter 227D-3.

In accordance with Section 93-16, Hawaii Revised Statutes, I am also informing you that the report may be viewed electronically at:
http://dbedt.hawaii.gov/overview/annual-reports-reports-to-the-legislature/.

Sincerely,

James Kunane Tokioka
DBEDT Director

Enclosure

c: Legislative Reference Bureau

ec: Governor's Policy Office
Lieutenant Governor's Office
Legislative Auditor
Department of Budget and Finance

Natural Energy Laboratory of Hawaii Authority

HOST PARK

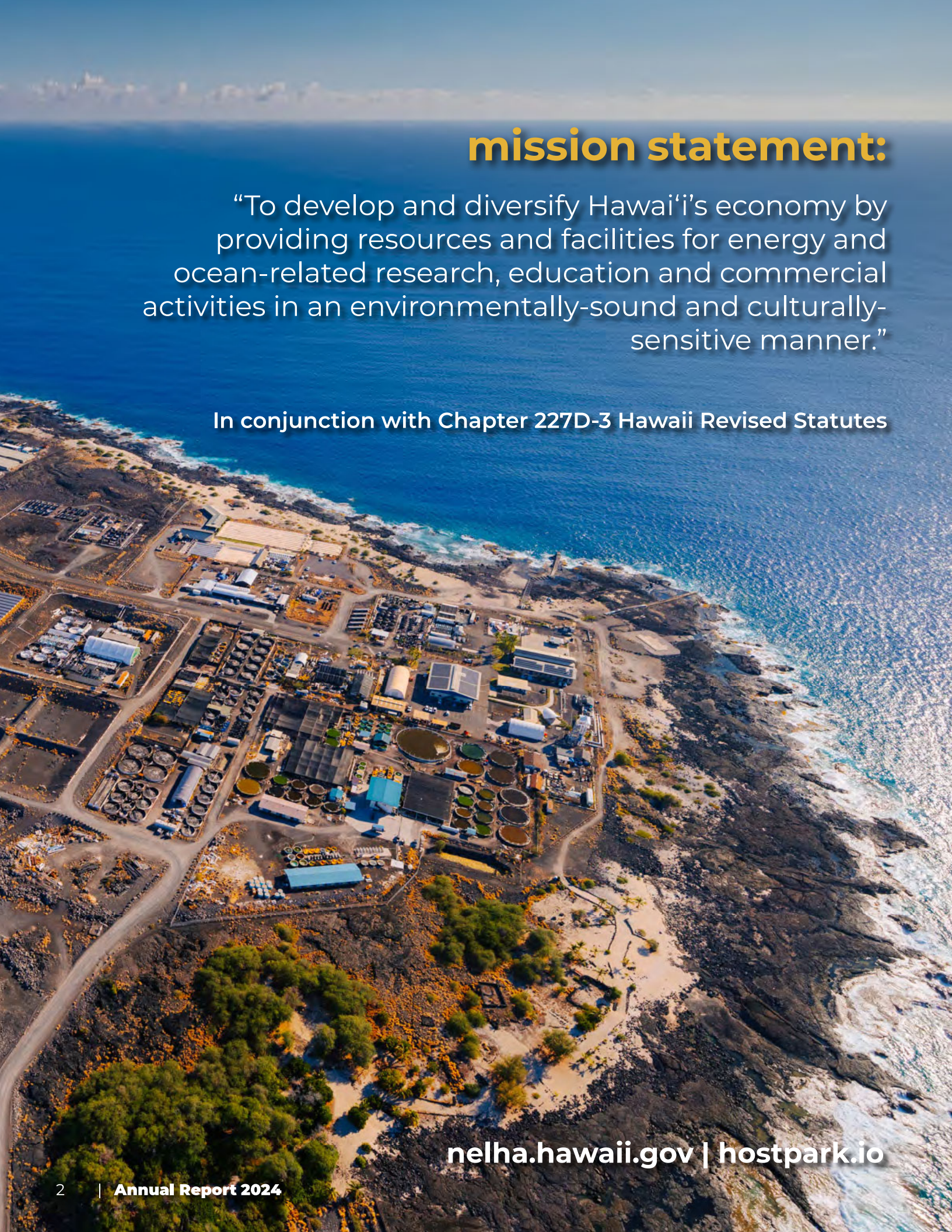
2024

Annual Report

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 | hostpark.io

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Appendix: Historical Timeline of Major Events (1974 - 2024) 38-43

ON THE EDGE: The Mauka Research Campus sits right on Keahole Point of Kailua-Kona. The rapid descent starts from a rocky shoreline that leads to about 15 to 20 feet, followed by a more gradual slope until about 40 to 50 feet. Beyond this, between the depths of 500 and 2,500 feet, the incline sharpens to approximately 30 degrees.

Interspersed within this basaltic expanse are passages of white sand, as well as remnants of the 1801 Hualālai lava flow, which can be found in thick beds down to depths of 420 feet. HOST Park leverages this unique bathymetric feature by having cold water pipes tap into the profound depths of 2,000 to 3,000 feet, while warm water pipe intakes are positioned between 30 and 80 feet below sea level.

This rare combination of deep and shallow water access in close proximity is a key reason why Keāhole Point was selected for HOST Park, providing an unparalleled opportunity for deep-sea and surface seawater pumping applications. Photo Credit: Tetrachrome

Major Goals and Key Objectives

In FY 2024, NELHA continued to solidify HOST Park's position as the world's premier ocean science and technology park by focusing on:

• Community-Centered Development to ensure that the park's growth aligns with the needs and aspirations of the local community.

• Economic Growth and Job Creation to stimulate economic development and generate high-quality jobs by attracting and supporting innovative ocean economy businesses.

• Infrastructure Enhancement by investing in state-of-the-art infrastructure and facilities to support cutting-edge research, development, and commercialization.

• Entrepreneurial Ecosystem by cultivating a vibrant entrepreneurial ecosystem that nurtures innovation, collaboration, and the growth of startups and small businesses.

• Focus on Key Sectors by prioritizing growth in critical sectors such as food security, energy security, ocean technology, and ocean conservation.

By achieving these objectives, NELHA seeks to position HOST Park as a global hub for ocean science, technology, and sustainable solutions.

This document reports on the specific goals and objectives that were established for NELHA for FY 2024.

IMPACT HIGHLIGHTS 2024

HOST PARK

7 NEW HOST PARK CLIENTS IN 2024

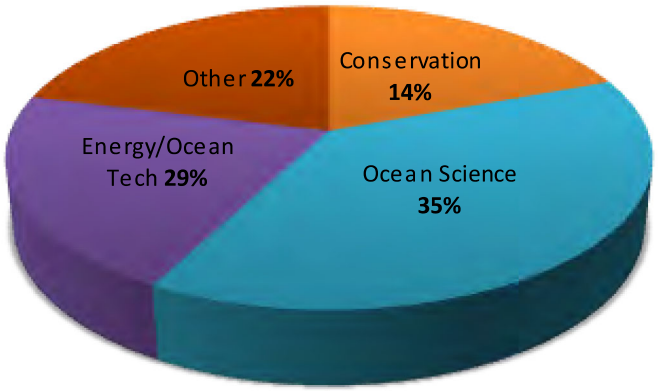
total projects supported: 55

utilities

- pump stations use **100%** renewable energy between 10-3 p.m.
- pump efficiency: set target at **<0.4** kW/kgal

6 billion · gallons seawater delivered to clients

COMPANIES BY SECTOR



HATCH

INCUBATOR INITIATION (EDA FEDERALLY-FUNDED)

- 4 new Ocean Foundry Incubator companies
- 9 new accelerator cohort companies
- 40 participants AquaHack ideation workshop (all Hawaii based)

economic impact

General funds received in FY 2024:	$0
CIP Funds received in FY 2024:	$0
NELHA self-generated revenues:	$5M
HI Tax revenue generated*:	$7M
Economic impact*:	Over $140M
Jobs*:	700+

(According to a UHERO analysis for 2022)*

Economic Impact

HOST Park: A Catalyst for Hawaii's Blue Economy

NELHA administers the Hawaii Ocean Science and Technology (HOST) Park which continues to generate over $140M in annual economic impact to Hawaii.

While no State general funds are provided to NELHA for operations, the activities at HOST Park generate annual tax revenue to the State on the order of $5M to $7M.

This impact is consistent and trending upwards, despite challenges provided by the COVID pandemic illustrating the resilience of the sectors that NELHA focuses on. The companies at NELHA attract outside investment and in many cases have significant exports, both important for the State of Hawaii's economic wellbeing.

Since 2010 and every three to four years, NELHA engages the Economic Research Organization at the University of Hawaii (UHERO) to conduct an economic impact analysis.

HOST Park Economic Impact Analysis 2010-2022

Calendar Year	Total Economic Impact	State Tax Revenue	Jobs
2010	$88M	$4.5M	583
2013	$123M	$5M	617
2018	$103.6M	$4.9M	509
2022	$148.4M	$7M	714

NELHA's role in the broader Hawaii economic landscape is to provide diversification, specifically on Hawaii Island. The state led innovation cluster strategy was pursued with an emphasis on the blue economy given the assets available at HOST Park. In 2024, even the energy initiatives primarily utilize ocean and/or solar technologies.

Within the main sectors covered by NELHA's portfolio companies, there is overlap with respect to addressing food security, advanced manufacturing and other areas that are part of Hawaii's efforts to further economic development and sustainability in the State and which are covered by other State departments and/or agencies.

NELHA has partnered with State academic institutions, in particular the University of Hawaii (Hilo and Manoa), Palamanui Community College located 10 mn away for workforce development.

It has partnered with Hawaii Housing Finance & Development Corporation and others to find solutions for freshwater availability to continue to develop the park in conjunction with addressing local housing needs.

The State Energy Office and NELHA continue to work on specific projects as well as assisting with reaching energy goals.

HOST Park Clients 2024

The majority of HOST clients locate at the park in order to tap into the seawater system.

A small number of clients are located at HOST to support other clients or to be part of the only innovative tech focused ecosystem of its size in West Hawaii. In 2024, there were 55 projects.

Ocean Science:
This category which includes aquaculture is the largest one by number and land use for NELHA.

It includes R&D and commercial companies that specialize in microalgae, seaweed, SPF shrimp, shellfish hatcheries, abalone production, seahorses and finfish.

Blue Ocean Mariculture
open ocean farm that raises Hawaiian kanpachi fish

Cyanotech
aquaculture, microalgae products including *Spirulina* and astaxanthin

Ocean Era
fin fish, seaweed hatchery and research

Pacific Seafood
oyster, clams, mussel hatchery and nursery

Royal Hawaiian Sea Farms, Inc.
commercial aquaculture

Shrimp Improvement Systems
SPF shrimp

Symbrosia
seaweed for reducing livestock methane emissions

Big Island Abalone Hawaii
abalone production

Blue Ocean Barns
seaweed for reducing livestock methane emissions

Taylor Shellfish Farms
oyster, clam, mussel nursery

Jamestown Point Whitney Shellfish
oyster and clam nursery

Forever Oceans
fin fish project

Pacific Hybreed
shellfish breeding

Seahorse.com Ocean Rider Kailua Kona, Hawaii
aquaculture seahorses

Indo-Pacific Sea Farms
develops and sells aquaculture products for saltwater aquarium

Moana Marine Biotech
biotech company that develops shrimp breeding technologies

Pacific Planktonics
ornamental fish and shrimp culture of native Hawaiian species

marine biologics
develop biotechnology to design industrial compounds from macroalgae

Conservation:
This category includes companies whose main focus would be considered conservation whether it be ridge-to-reef efforts, ocean health or endangered species rescue work.

The work in this category is growing as more local and global attention is given to important conservation issues.

Terraformation
ridge-to-reef sustainability project

The Nature Conservancy
in-situ coral restoration pilot projects in West Hawaii

'Ākoʻakoʻa
coral reef restoration

Monterey Bay Aquarium
research on deep sea species

Dear Ocean
nonprofit ocean conservation

MEGA LAB
ocean observing system

Ke Kai Ola The Marine Mammal Center
monk seal rehabilitation center

HOST Park Clients 2024

Energy and Ocean Technology:
This category includes companies involved in cutting edge energy R&D relevant to Hawaii such as OTEC, H2, solar and energy storage, as well as companies involved in climate solutions, ocean sensors and off grid manufacturing.

Some of these companies and projects are important to Hawaii's goal of meeting 100% clean energy by 2045.

MAKAI OCEAN ENGINEERING
OTEC research and development

HNEI Hawai'i Natural Energy Institute, University of Hawai'i at Mānoa
hydrogen station R&D

captura
direct ocean carbon capture company

NOAA
acoustic monitoring of Kona Coast for cetacean presence

Smarthomes.us
IT, AV sales, home automation, network design and installation

LightManufacturing Hawai'i Island
solar manufacturing and heliostats

Oregon State University
develop ocean tech for ocean health monitoring

antenna, government

Physics, Materials, and Applied Mathematics Research L.L.C. PM&AM RESEARCH
research autonomous ROVs and sensor instrumentation

INTEGRATED OFFGRID
testing solar-power system to produce potable water

SEATREC
R&D harvesting energy from environmental temperature differences

orion SPACE SOLUTIONS
designs and launches satellites and ground stations to monitor space weather.

PACIFIC FILTRATION SYSTEMS
R&D for water membrane technology

APPARENT
Renewably-sourced, low cost, real-time carbon reduction technology

SEA-BIRD SCIENTIFIC
instrumentation validation

Other:
The companies in these categories include academic and educational efforts such as a charter school and various University of Hawaii related projects as well as business ventures that capitalize on the deep seawater unique properties to create water and salt products.

Business support entities are also included in this category. These all help to form the unique NELHA tech park ecosystem.

KONA SALT FARM
SEA SALTS OF HAWAII
extracts salt from deep seawater

Matsuyama Food and Fuel
convenience store with NELHA products and fueling station

ARL
conducts R&D to support Dept. of Defense and Navy

ISLA
research, infrasound monitoring

KONA DEEP
production of desalinated deep seawater beverages and products

HATCH
aquaculture accelerator

Ryan Westerberg
software development

RedVox, Inc
smart device and cloud applications

KOYO USA CORP
Hawaii Deep Sea Water
production of deep seawater products, desalination and bottling

HAWAI'I SBDC SMALL BUSINESS DEVELOPMENT CENTER
business advising, capital formation assistance

Napoli ART
ocean art production

WHEA
charter school for grades 6-12

How do NELHA Activities and Accomplishments Align with HRS Chapter 227D?

HRS 227D 7 Stated Purpose/Duties	FY 2024 Activities/Efforts/Initiatives
Establish, manage, operate facilities (R&D, Commercial, Educational)	• Established a cultural hui • Completed design work for Hale Wawaloli Visitor Center • Completed 90% design work for 20,000 sq. ft. Innovation Center • Started to utilize the recently purchased Mauka Research Campus
Provide support, utilities, services	• Seawater system maintained 99% uptime • Installed 500kW PV array and 750kWh energy storage to power 55" pump station • Started implementing action plan to address seawater quality concerns by hatcheries
Maintain physical structure of facilities	• Retrieved abandoned and damaged offshore pipelines • Initiated work to upgrade ageing electrical and seawater infrastructure
Promote and market facilities	• Launched new hostpark.io website • Implemented online tour
Promote and market available natural resources	• Student tours (reached 800+ K-12 kids) • 50th Anniversary Open House (1,700 visitors)
Support ocean research and tech that support national and state interest, use facilities and foster commercial development	• Initiated onshore EIS • Started preparing for offshore EIS • Supported over 55 companies/projects at HOST Park • Continued to grow the aquaculture entrepreneurial ecosystem by offering accelerator and workshops through HATCH
Engage in retail, commercial and tourism activities	• MATS4 LLC convenience store and fueling station started providing services to HOST Park clients and the public

Community Outreach

PUBLIC ENGAGEMENT AND RELATIONS

KEY ACCOMPLISHMENTS

- Formation of a Cultural Advisory Hui
- Key Partnerships with Academia and Businesses
- NELHA's 50th Anniversary Open House
- Implemented School Tours Program
- Master Plan and EIS Update Process Started

COMMUNITY ALIGNMENT

Objective: Continue to align NELHA goals to the changing needs of the community that ultimately fosters comprehensive growth which supports the community.

A cultural hui named Pā Pāʻaiea and consisting of nine members was established to engage the community, and specifically lineal descendants in defining vision, mission, values, and priorities.

NELHA staff sought input, feedback, and suggestions on how to improve NELHA's plans to address the community needs and understand expectations to ensure that plans reflect the community's diverse perspectives and interests.

Work done with this hui has led to improvements to the proposal and business plan evaluation methodology by NELHA staff as well as prioritization of Ka Pa'aikai analysis and community outreach when contracting for EIS update professional services.

The hui's work, initially facilitated by Sea Grant and The Nature Conservancy, continues and is evolving as the hui members establish a framework for continued and future engagement.

KEIKI CUTIES: Kealakehe Elementary School students throw up shakas as they get ready for the walking portion of the tour. It's the last school tour for 2023-2024 before the start of summer break. Photo Credit: Rae Nguyen

FISH ART: Keiki's and their parents gather around the HATCH Blue table at NELHA's 50th Anniversary Open House to draw up colorful sea creatures. Photo Credit: Sarah Karner

NELHA significantly increased its outreach efforts in 2024 by actively engaging through social media, and providing opportunities to learn about HOST Park and related projects and technologies through regular seminars which are open to the public and can be attended in person or via zoom.

An interactive virtual tour was made available late 2023 so that community can learn about the exciting projects at HOST Park.

A variety of interviews and other materials is also available at the new site for those wanting to explore the park's history and current activities.

Because workforce development is critical, NELHA Began offering K-12 school tours in which more than 800 students have visited HOST Park since its implementation back in November 2023.

The program includes an interactive presentation, a walking tour, and touch sensory displays for children to learn there's a bright future for jobs here in Hawaii in the areas of aquaculture, marine technology, renewable energy, and ocean conservation.

At the same time, NELHA continued to collaborate with workforce development partners such as Good Jobs Hawaii, Palamanui Community College, HU Hilo, Kupu Aina, Sea Grant, ClimbHI, Akamai workforce development and others to help meet the workforce needs of the companies establish at HOST Park and provide high quality local STEM jobs.

In early summer 2024, NELHA Initiated the update of the existing onshore EIS as well as the Master Plan covering the entire 870-acre HOST Park.

The purpose of this effort is to allow NELHA to grow businesses in alignment with community goals at a location that supports appropriate natural resource utilization and results in economic development including supporting research projects and facilitating the transition from research and development to pilot scale and then to full commercial operation of companies at HOST Park.

NELHA has initiated efforts to prepare a programmatic EIS for the waters offshore of HOST Park as a location for research, testing and demonstration of innovative conservation, energy, offshore aquaculture or ocean monitoring concepts. Completing an EIS for this research corridor would allow for more rapid, iterative permitting of allowable projects.

The EIS would describe specific activities that could take place in these waters and would provide a path for expedited approval for short-term, small-scale, non-commercial demonstration or research projects for offshore aquaculture, energy, ocean monitoring and conservation activities.

NELHA which was formed in 1974 turned 50 in 2024, providing an opportunity to showcase NELHA projects and activities through an open house that took place on October 19, 2024.

The event attracted approximately 1,700 visitors and was a great success.

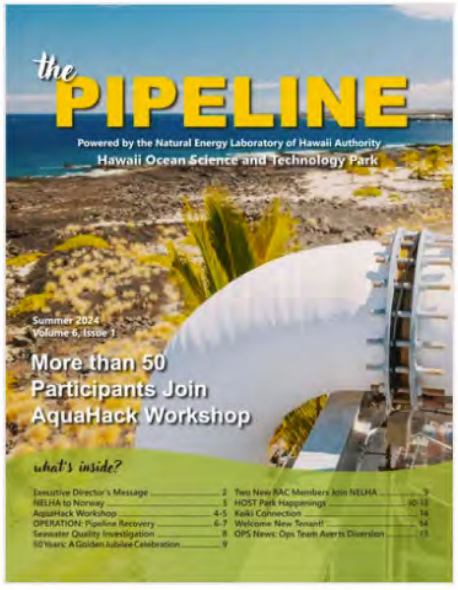
HAPPY AS A CLAM: This curious keiki feels the deep cold seawater that is keeping the clams content at NELHA's 50th Anniversary Open House. Photo Credit: Rae Nguyen

HERE COME THE DRUMS: Taiko drummers make their entrance at the beginning of the Ocean Arts Summit Program on the day of NELHA's 50th Anniversary Open House. Photo Credit: Tetrachrome

Visitors enjoyed live entertainment, including taiko and hula performances, farm tours, art displays, interactive games, and delicious food grown right at HOST Park.

Over 35 HOST Park clients and partners collaborated to create an unforgettable event, generating incredible buzz and sparking interest in the park's innovative ventures.

By partnering with the Hawaii Keiki Museum's Ocean Art Summit entitled "An Ocean of Possibilities," the Open House provided visitors with a unique opportunity to explore the diverse and exciting projects underway at HOST Park.

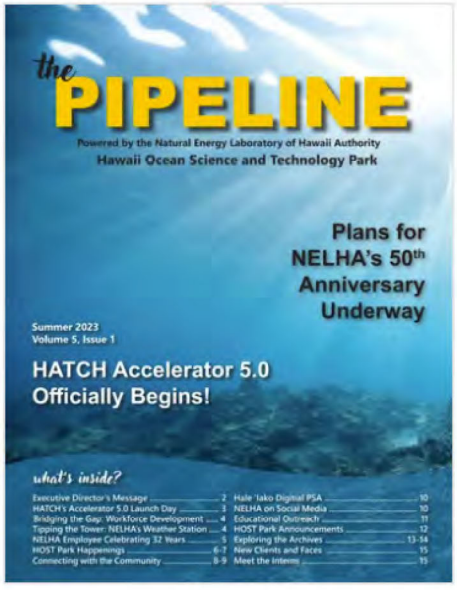


HOST Park's The Pipeline

July 3, 2024

HOST Park's The Pipeline

January 29, 2024



HOST Park's The Pipeline

July 12, 2023

A LOOK INTO THE FUTURE: A rendition of a possible HOST Park's Hale Wawaloli Visitor and Education Center planned at Wawaloli Beach. Photo Credit: WRNS Studio

The Hale Wawaloli Visitor and Education Center planning and design work is complete.

Designed with the intent that it would serve as the public viewport on the science, engineering, and business activities at HOST Park, as well as a Ho'okupu (gift) to the people of West Hawaii, the development includes a multi-purpose covered pavilion and an open amphitheater space for community gatherings and public events, so that all may enjoy the blessings of Wawaloli Beach park.

Funding of approximately $700,000 will be needed for construction.

HOST Park Management

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

Objective 1: Grow revenue by increasing lease of land and sale of seawater to maintain operating self-sufficiency.

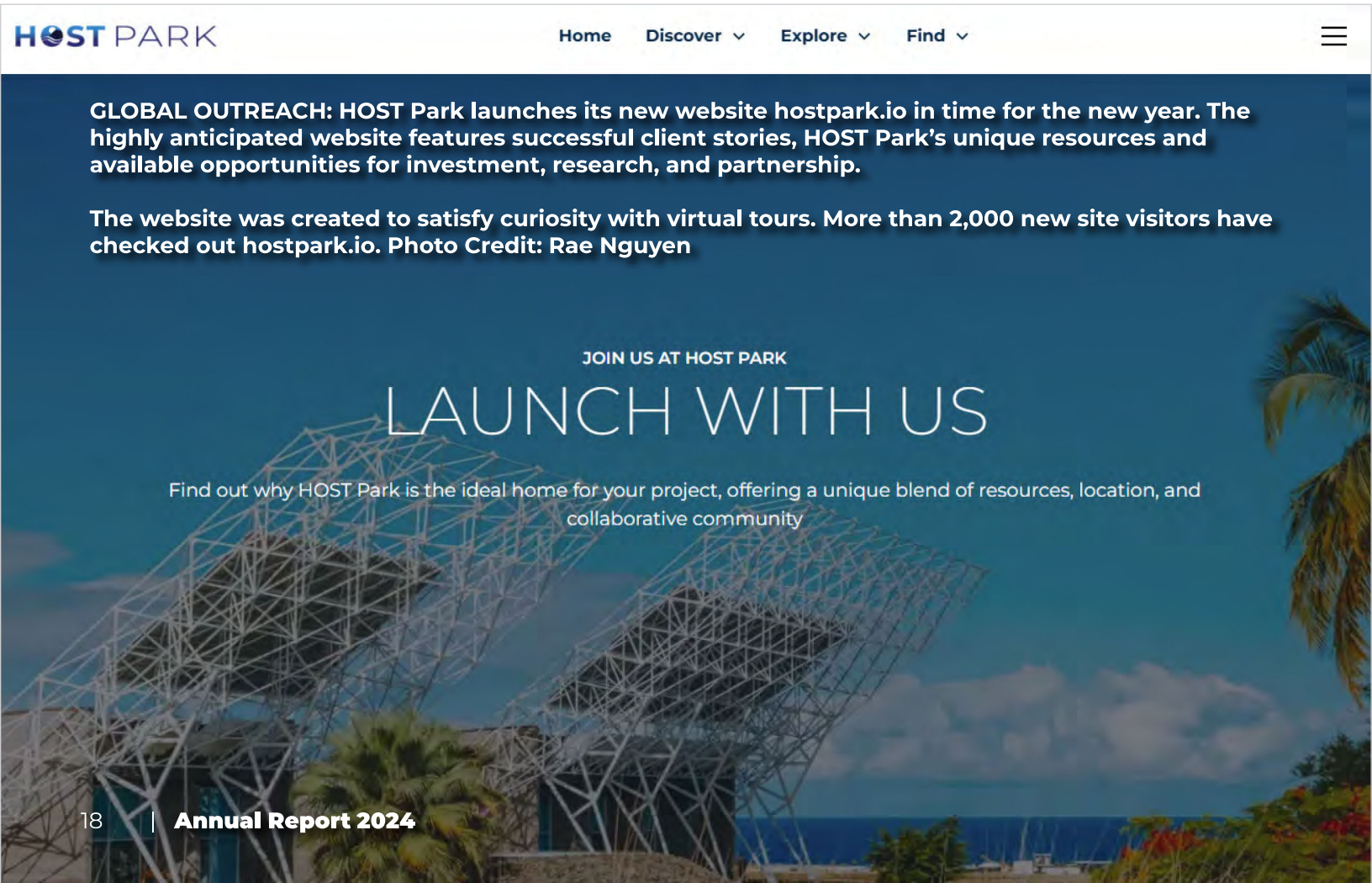
NELHA administered HOST Park to maintain self-sufficiency in FY 2024 through the following activities:

• Continued to increase revenue streams within the NELHA Board approved business plan through continued efforts to maintain occupancy in Makai Research Campus, vacant lands in HOST Park and additional customers for Water Quality Lab (WQL) work. Increase utilization of under-utilized assets.

• Implemented marketing plan using EDA grant funds, website updates and social media sites.

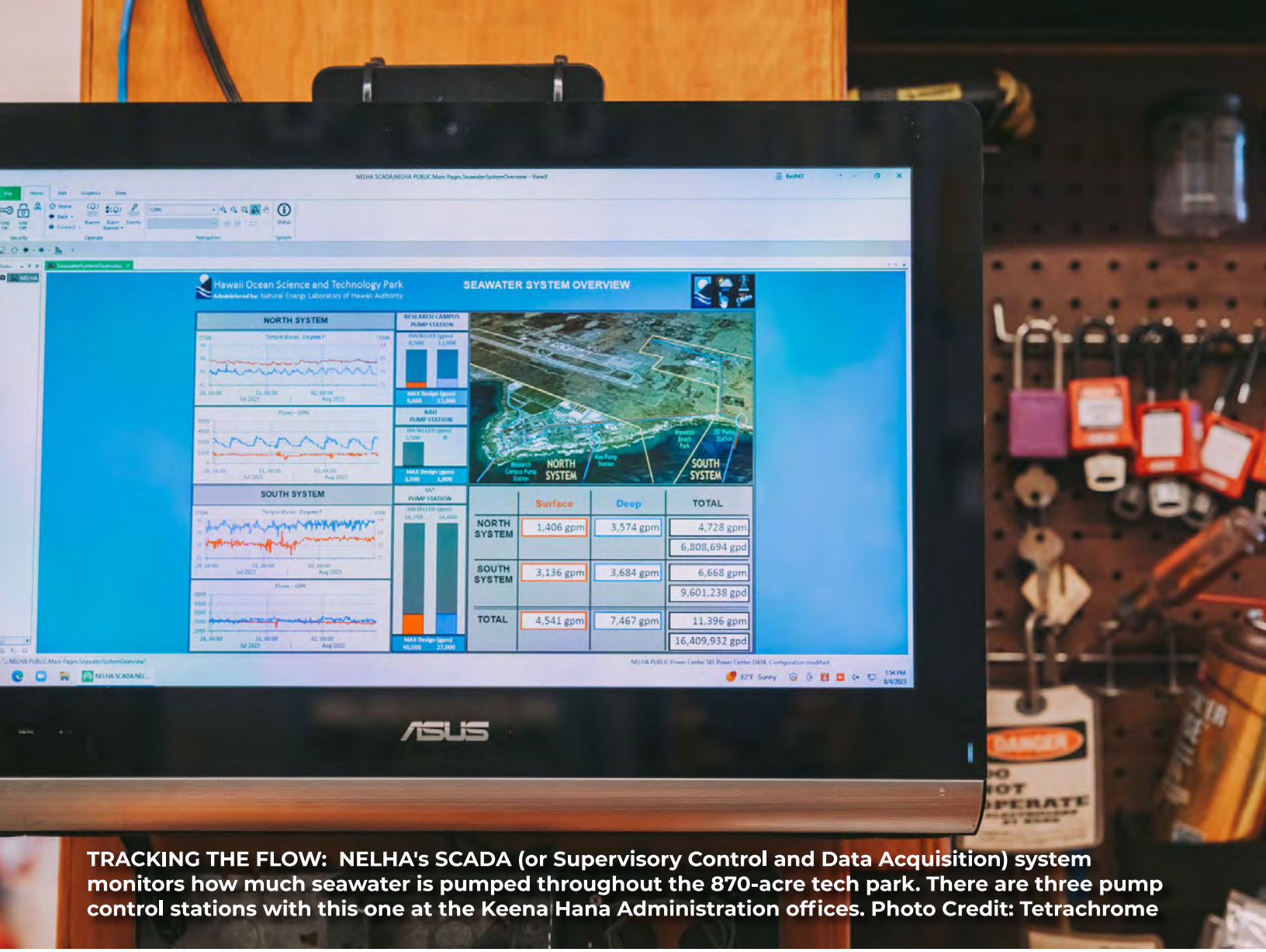
• Continued to improve landlord/tenant relationships. Conduct periodic satisfaction survey of tenants at NELHA and make improvements to increase satisfaction where necessary including seawater quality analysis.

• Produced semi-annual newsletter.



GLOBAL OUTREACH: HOST Park launches its new website hostpark.io in time for the new year. The highly anticipated website features successful client stories, HOST Park's unique resources and available opportunities for investment, research, and partnership.

The website was created to satisfy curiosity with virtual tours. More than 2,000 new site visitors have checked out hostpark.io. Photo Credit: Rae Nguyen



TRACKING THE FLOW: NELHA's SCADA (or Supervisory Control and Data Acquisition) system monitors how much seawater is pumped throughout the 870-acre tech park. There are three pump control stations with this one at the Keena Hana Administration offices. Photo Credit: Tetrachrome

• Continued to formulate and effectively communicate a motivating vision, goals, and strategic direction for NELHA. Provide 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, experience to grow, think strategically and act within the responsibilities of their job descriptions.

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

THINKING SPACE: The Hale Iako building at the Makai Research Campus holds more than 15 different ocean and energy related companies in its incubator space. Plans are underway to develop additional office space at the Mauka Research Campus as shown here. Photo Credit: Tetrachrome

In FY 2024, the makai research campus was at full capacity.

With the high demand for space availability for small projects, as opposed to large commercial ones, NELHA focused on completing the planning and design work for the first phase of the NELHA Innovation Center and acquiring the Mauka Research Campus.

The Mauka Research Campus, purchased in 2023, was utilized for outreach activities in 2024, in particular in preparation for the 50th anniversary in October 2024.

Planning for utilizing this facility for short to medium term project continues.

Some of the technologies demonstrated will be aimed at addressing energy and food security challenges as well as reduce human dependence on wild fisheries and stressed ocean ecosystems.

Others will be focused on improving monitoring of the worlds' oceans.

This additional space, once leased, is expected to add a significant revenue stream.

More importantly, the facility will allow NELHA to provide space and resources to researchers and entrepreneurs focused on developing and demonstrating disruptive technologies in the blue economy sector.

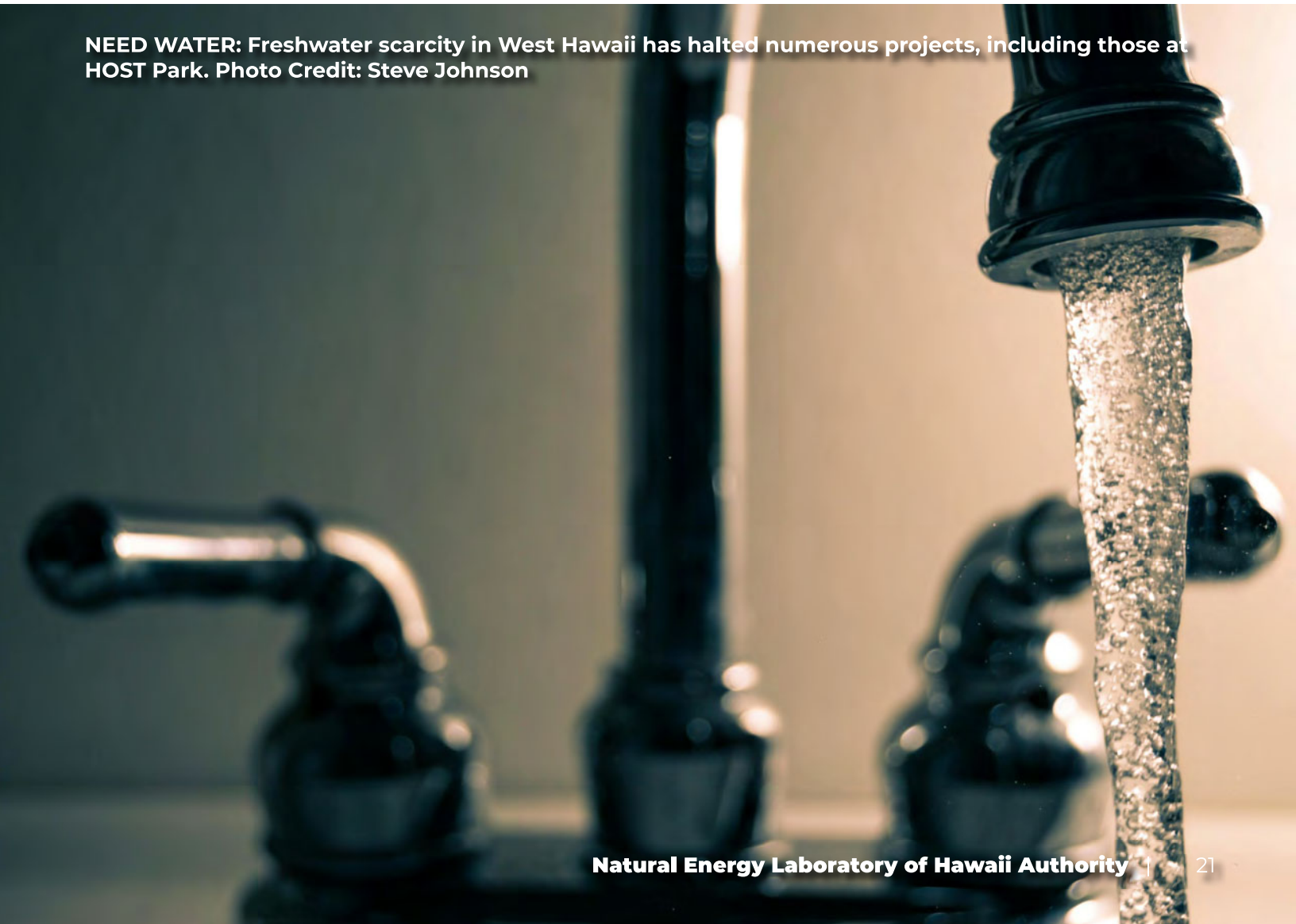
Objective 2: Increase accessibility to remaining undeveloped lands and increase potable water availability to allow for increased growth.

New roads are needed to fully build out HOST Park and provide access to approximately 100 acres. Funding is not currently secured to complete this work.

Freshwater is a significant constraint for further development at HOST Park.

NELHA continues to work with partners at State, HHFDC and community stakeholders to reach consensus on permit conditions to increase freshwater allocation to allow for expansion.

NELHA is also looking at alternative sources of freshwater and has initiated work to conduct an offshore survey to determine the feasibility of accessing deep layer aquifer to supply freshwater on the western side of Hawaii Island.



NEED WATER: Freshwater scarcity in West Hawaii has halted numerous projects, including those at HOST Park. Photo Credit: Steve Johnson

MISSION COMPLETED: NELHA retrieved a 200 feet-long section of a pipe floating offshore of Keahole Point on May 1. Believed to be a portion of a now defunct pipeline 16A - one of six installed in the 1990s by a former tenant no longer in business.

NELHA operations team - with the help of Makai Ocean Engineering and Blue Ocean Mariculture - removed the pipes quickly for the safety of swimmers, boaters and wildlife in a mission aptly named: Operation Pipeline Recovery.

Thanks to Jack's Diving Locker, Isemoto Contracting and SOEST PacIOOS lab, the pipelines were brought ashore and property disposed.
Photo Credit: Pam Madden

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

TESTING THAT HYPOTHESIS: Water Quality Lab Manager Pam Madden tests the quality of the deep seawater at Ono Wai Hale laboratory. Photo Credit: Tetrachrome

Objective: Maintain reliability and increase energy efficiency of seawater system.

NELHA continued to maintain 99.9% uptime in 2024. To assist with increasing efficiency and keep cost down, staff worked on a long-term plan for renewable energy upgrades to HOST Park. Primary emphasis is 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.

In the context of this plan, construction of the 55” Pumpstation PV/Storage microgrid was completed. This installation includes 500KW solar ground mounted PV array, 750kWh energy storage and aims to power the 55” pump station and provide a testbed for AI control algorithms.

The project follows a MOU executed between the State of Hawai‘i and Korea Institute of Energy Technology Evaluation and Planning (KETEP), signed by Governor David Ige in 2015 to mutually benefit both parties through cooperation and coordination of resources in the development of green energy technology, including energy efficiency, new and renewable energy, microgrid and energy storage systems.

Project partners included Hawai'i Natural Energy Institute (HNEI) at University of Hawai'i (UH) Manoa, KETEP, Encored Technologies, LG Electronics, Seoul National University, and Gwangju Institute of Science and Technology.

NELHA executed on plans to address the long-term status of abandoned deep seawater pipelines from a former tenant over 30 years ago.

A detailed locational survey using underwater remote operated vehicles of deep seawater was completed and a strategy to address the removal of these lines was developed along with a cost estimate. The next step will be to secure the necessary funding.

In the meantime, in early summer of 2024, NELHA retrieved a 200 ft long section of pipe that floated off of Keahole Point which is believed to be a portion of the defunct pipeline system.

High surf in 2024 also damaged part of the Kau pipeline system.

Emergency procurement was utilized to recover the portions of the system that were of immediate threat to safety. Staff then competitively bid the removal of the portions that had a longer runway. It is expected that the Kau pipeline system will be removed and therefore retired in FY 2025.

NELHA staff continued to upgrade SCADA and WQL with new instruments/monitoring devices controlled by WQL including new nutrient analyzer, upgrading SCADA software and add additional monitoring devices to SCADA system.

NELHA initiated the work necessary to expend $1.9M reimbursable bonds provided to upgrade NELHA's aging infrastructure.

This includes the upgrade needed for Makai Research Campus and Farm Compound Infrastructure Electrical Grid. The electrical infrastructure at the Makai Research Campus and Farm Compound is at "end of life" status and replacement of this critical electrical infrastructure is high priority.

NELHA has worked closely with HELCO to identify potential new transformer locations, vault infrastructure, main switchgear, and meters.

In response to sea surface water quality concerns by companies that conduct larval runs, NELHA hired a leading expert to evaluate and provide recommendations for system improvements.

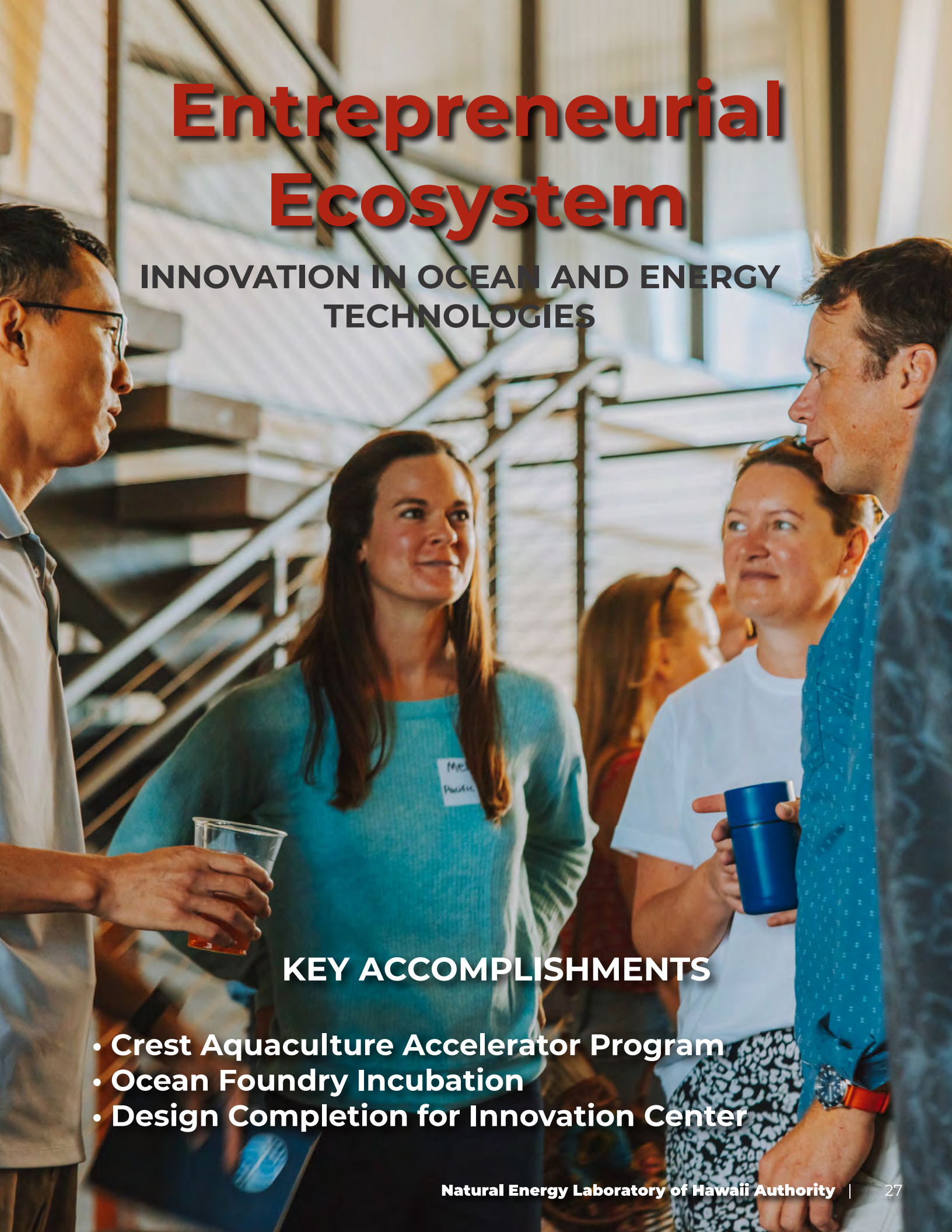
NELHA is working closely with interested tenants to develop system improvements based on the recommendations to assit with long term success.

Deferred maintenance continues to be a concern and NELHA is actively planning to address the issues presented by an aging infrastructure by developing a comprehensive plan.

AN OYSTER'S WORLD: Oysters, clams, and other shellfish were served at the 50th Anniversary Open House, where almost 2,500 lbs were consumed at the one-day event. Photo Credit: Tetrachrome

Entrepreneurial Ecosystem

INNOVATION IN OCEAN AND ENERGY TECHNOLOGIES



KEY ACCOMPLISHMENTS

- Crest Aquaculture Accelerator Program
- Ocean Foundry Incubation
- Design Completion for Innovation Center

ENTREPRENEURIAL ECOSYSTEM AND INNOVATION IN OCEAN AND ENERGY TECHNOLOGIES

Objective 1: Grow aquaculture accelerator.

NELHA continues to manage the contract for the operation of the accelerator with Hatch Accelerator Fund Management LLC. , as funded by the Department of Commerce EDA. This work included the coordination with other State agencies in evaluating feasibility of establishing Hatch II follow on fund.

HATCH runs an annual accelerator program (Crest Accelerator) for businesses interested in supporting aquaculture. This has included companies that focus on sensors, AI, energy, animal health and other areas.

HATCH is providing an ongoing incubator program, called the Ocean Foundry of which there are 4 participants based at HOST Park. This program allows for longer term presence at HATCH's facility for pilot testing and ongoing support.

Finally, HATCH has organized two ideation workshops geared primarily to spark interest locally and help create new businesses that aim to solve local aquaculture or loko i'a issues.

AQUACULTURED: HATCH Blue implemented programs like the Crest Accelerator, AquaHack and just recently, The Blue Venture Builder to reach to potential aquaculture companies.
Photo Credit: Tetrachrome

COMMUNITY INTRODUCTION: Captura's COO Christene Banda talks to an interested visitor at NELHA's 50th Anniversary Open House Oct. 19. Captura recently started construction at the makai research campus is looking to go operational sometime in early 2025. Photo Credit: Tetrachrome

The first ideation workshop called AquaHack 1.0 provided learnings that formed the basis of the next generation of ideation workshops, now labeled Blue Venture Builder Hawaii.

NELHA continues to work with partners to broaden the scope of the accelerator work NELHA is conducting to the areas of ocean technology, ocean conservation, ocean-based climate resilience.

At the same time, startups such as Captura Corp. specializing in marine carbon capture are establishing their pilot projects at HOST Park.

Matsuyama's Food and Fueling convenience store also had a grand opening where customers can now shop at their retail market, dine at their onsite restaurant and fuel up and go.

Objective 2: Continue efforts to plan and complete additional facilities to "tee-up" and provide new office and incubator space for start-up businesses.

NELHA has completed 90% design for Makai Research Campus expansion or Innovation Center (IC). Funding will need to be secured to proceed with the construction of this shovel ready project.

Situated on a nine-acre vacant ocean-front parcel, near the existing research campus, the NELHA IC is intended to become a world-leading focal-point for state-of-the art research and development of ocean or blue economy technologies.

The completed design for the first element of this new campus includes a building enclosing approximately 20,000 sq. ft. with office, common, and conference space, laboratory and wet-room research space with flowing seawater, and a “maker-space” workshop, outside work-spaces and meeting nooks, as well as support areas for maintenance and storage, vehicular and pedestrian accessible routes, parking areas for motorized and non-motorized vehicles, security, and environmentally appropriate landscaping.

WHAT THE FUTURE HOLDS: Rendition of the NELHA Innovation Center. Photo Credit: WRNS Studio

CAPITALIZING KONA'S HIGH INSOLATION: HOST Park is steadfast in its mission towards a sustainable future. This solar installation at the 55" microgrid capitalizes on the park's high solar insolation, comparable to that of Phoenix, Arizona, enabling NELHA to harness abundant solar energy. Photo Credit: Tetrachrome

Objective 3: Continue efforts to develop energy technology testbed and efforts.

As NELHA commissions the 55" station microgrid, NELHA has sought UH HNEI assistance in evaluating its efforts relating to renewable energy R&D. A report has been produced based on stakeholder input collected.

It describes the successes thus far, and the ongoing and expected future challenges such as limited resources and expertise, ageing infrastructure and deferred maintenance, as well as the challenges of demonstrating new technology while operating a seawater utility that cannot afford downtime.

The report also provides recommendations on how NELHA may contribute to the effort in reaching 100% clean energy by 2045.

NATURAL ENERGY LABORATORY OF HAWAII AUTHORITY
FINANCIAL STATEMENT - FISCAL YEAR 2024

(Fiscal Year - July 1 to June 30)

	Fiscal Year 2024
REVENUES	
Land Use Fees	2,336,968.39
Seawater Royalties	27,162.07
Reimbursables	2,189,680.53
Interest Received	97,931.01
Other	365,878.53
Percentage Rent	36,401.62
Subtotal	5,054,022.15
EXPENDITURES	
Salaries	2,108,537.25
Operations	2,324,212.81
OHA (Ceeded Lands Transfer)	469,074.47
Subtotal	4,901,824.53
FINANCIAL POSITION	
Special Fund Cash Balance (July 1)	1,189,928.55
Prior Year Unrequired claims	-
Prior Year Transfers	-
Special Fund Revenues	5,054,022.15
Subtotal	6,243,950.70
Special Fund Expenditures	4,432,750.06
OHA (Ceeded Lands Transfer)	469,074.47
Encumbrances	399,952.81
Special Fund Cash Balance	**942,173.36**

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

HOST PARK COORDINATES
19.71595945050406, -156.0339520030186

MISSION STATEMENT:

"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."

$145M

TOTAL ECONOMIC IMPACT GENERATED AT HOST PARK IN 2022.

FOCUS ON:

- conservation
- energy conservation
- ocean technology
- food security

keāhole point

from its shoreline, the point's bathymetry or water depth measurement in oceans is a steep drop, plummeting to 2,500 ft.

HOST Park

or Hawaii Ocean Science Technology Park serves as an outdoor demonstration site for emerging renewable and ocean-based technologies.

Over 50 companies, ranging from entrepreneurial startups to established commercialized firms are based at HOST Park.

FAST FACTS

- **land - 870 acres**
- **high solar insolation - just one day less sunny than Phoenix, AZ over one year**
- **more than 20M gallons of seawater pumped daily**
- **land dedicated to renewable, ocean & sustainable industries**

TYPES OF COMPANIES

AQUACULTURE | TECHNOLOGY
CONSERVATION | ENERGY
EDUCATION | OTHER

10 MILES

of pipeline system plumbed throughout HOST Park and delivering surface and deep seawater nonstop 24/7.

GREEN BUBBLES: Known as "sea grapes" or "caviar of the sea," *caulerpa lentillifera* is a species of edible green algae prized for its soft, succulent texture. It can be eaten raw, added to soups and rice dishes, or used as a garnish for sashimi and poke. Photo Credit: Tetrachrome

NELHA Board of Directors
2024

The Natural Energy of Hawaii Authority 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.

Noelani Kalipi
CHAIR
GOV. APPOINTEE
Kalipi Enterprises
FY 2024

Cyd Miyashiro
VICE-CHAIR
Formerly Chair 2024
GOV. APPOINTEE
American Savings Bank
FY 2024

Gordon Bruce
GOV. APPOINTEE
Cyber Security
Consultant
FY 2024

Alan Hilton
RAC CHAIR
Consultant
FY 2024

Dr. Phil Bossert
RAC SECRETARY
Hawaii Association of Independent Schools
FY 2024

Dr. Vassilis Syrmos
University of Hawaii
FY 2024

Russell Tsuji
DLNR
FY 2024

Douglass Adams
County of Hawaii
FY 2024

Dane Wicker
DBEDT
FY 2024

Gregory Kim
HTDC
FY 2024

Dick Jones
TENANT REP.
Blue Ocean Mariculture
FY 2024

Nate Tsao
TENANT REP.
Jamestown Point Whitney Venture, LLC
FY 2024

NELHA Team

NELHA staff comprises a small crew of 15 employees, each with unique skills and qualifications needed to oversee HOST Park.

Incumbent	Position Title
Bryan Babbitt	Engineer Projects Coordinator
Greg Barbour	Executive Director
Brian Berg	Utility Electrician I
Chad Debina	General Laborer
Faustine Edge	Administrative Assistant
Dr. Alexander Leonard	Chief Projects Manager
Pamela Madden	Water Quality Lab Manager
Bryce Matsuoka	Groundskeeper and Maintenance Worker
Rae Nguyen	Marketing and Leasing Specialist
Keith Olson	Chief Operations and Science Officer
Sherry Ortiz	Account Clerk III
Daniel Randol	Industrial Electrician II
Jennifer Rasmussen	Business Manager
Laurence Sombardier	Deputy Director
Kevin Tapley	Industrial Maintenance Mechanic

TEAMWORK: State House Rep. Kirstin Kahaloa and Senator Tim Richards presented NELHA staff and interim Executive Director Laurence Sombardier with a certificate signed by the entire legislative body on the occasion of NELHA's 50th Anniversary Open House Oct. 19. Credit: Tetrachrome

A Hui Hou Greg!

Thank You for Your Years of Service

Gregory Barbour, a longtime champion of Hawaii's economic development, has recently retired after a distinguished career spanning over three decades.

His tenure at the Department of Business, Economic Development, and Tourism, coupled with his leadership at the Natural Energy Laboratory Hawaii Authority (NELHA), has left an enduring legacy.

Since joining NELHA in 2011, Barbour played a pivotal role in transforming HOST Park into a thriving hub for innovation and sustainability.

With a small but dedicated team, he oversaw significant infrastructural and organizational advancements, attracting over 55 businesses to the park.

These businesses have collectively contributed over $145 million to Hawaii's economy in 2022, solidifying HOST Park's position as a magnet for entrepreneurs and environmentally conscious ventures.

We extend our sincere gratitude to Greg for his invaluable contributions to NELHA and the State of Hawaii. We wish him all the best in his well-deserved retirement.

Appendix

History of Major Events

1974 - 2000

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

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

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

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).

1989

Puna Geothermal Facility and HGP-A well shut down. The Aluminum Company of Canada (ALCAN) develops program at the Laboratory for testing "roll bonded" aluminum heat exchangers.

1990

NELH, operated by UH and HOST Park, operated by HTDC merge to become the Natural Energy Laboratory of Hawaii Authority (NELHA).

1992

210 kW open-cycle OTEC Net Power Producing Experiment (NPPE) constructed at NELHA and operated by PICHTR.

1993

State Legislature passes Act 252 to better define the role of NELHA.

1994

Micro-tunneling begins to construct two 66" diameter tunnels under the shoreline and offshore reef as a pipeline protection crossing in preparation for NELHA's new 55" warm and cold seawater pipelines.

1995

CEROS transferred from HTDC to NELHA.

1998

NPPE open-cycle OTEC power plant decommissioned.

2000

Construction begins for 55" new offshore intake pipelines and pump station. Planning and design process started for new Hawaii Gateway Distributed Energy Center.

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.

2011

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

Appendix

History of Major Events

2002 - 2016

2012

UHERO's economic impact study revealed that HOST Park contributes significantly to the local economy, generating nearly $90 million annually and supporting 600 jobs. The Master Plan and Strategic Plan were updated, and a program audit was completed. Additionally, HOST Park secured $3.5 million in federal grants for renovations and $1.8 million in CIP funds for pipeline repairs.

2013

HOST Park economic impact surges by 40% 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 $30M in private/public projects underway.

2014

NELHA secured $2.5 million in CIP funding for a new exploratory water well. The organization strengthened its relationships with national laboratories, developed a strategic vision paper, and received the 2014 DBEDT "Team of the Year" award. Key partnerships were forged with Sandia, Lawrence Berkeley, Pacific Northwest, and National Renewable Energy Laboratories. Additionally, a MOU was signed with the County of Hawaii and HELCO to establish an energy storage system test bed. NELHA also revamped its 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.

2016

NELHA transformed the main administrative building into a 14,000 sq ft blue technology and advanced energy incubator, housing 17 offices. The NELHA Aquatic Species Health Management Program was significantly revised, including biosecurity policies and guidelines. An RFI was released for a prime site in the Ocean CenterPiece development area, and a national energy storage conference was organized. Additionally, a detailed archeological survey was conducted on the upper half of HOST Park.

Appendix

History of Major Events

2017 - 2024

2017

NELHA initiated significant projects to develop the 80-acre Ocean Center Piece, including a $10 million road construction project and exploration for a new freshwater source. The concept for a Hawaii Center for Aquaculture Sustainability was formulated, and a statewide aquaculture summit was hosted. The renovation of Hale Kaa was completed, marking the end of a five-year campus-wide renovation project. A lease was signed with Hawaii Natural Energy Institute to develop a hydrogen production facility. NELHA received the 2017 Mahalo Award from Hawaii Community College and the 2017 Community Service Award from ThinkTech Hawaii.

2018

NELHA secured a $1.928M DOE grant for a solar desalination project and $4.9M in CIP funds for seawater system upgrades. The Aquaculture Accelerator project was launched in partnership with HSDC, UH, and UH Ventures to boost Hawaii's global aquaculture presence. The second national energy storage conference was held, and a $142,500 grant was received to develop a 10-year renewable energy plan for the seawater system and microgrids. All studies and approvals for an exploratory water well were completed, pending a final permit.

2019

NELHA, in partnership with UH and HTDC, selected HATCH to operate the Hawaii aquaculture accelerator and manage the $8.4M investment fund. The first cohort of 13 companies was completed. A $275,000 EDA grant was received for this project. NELHA was selected by the Korean Institute of Energy Technology Evaluation and Planning for a $1.73M USD grant for microgrid development at the 55" pumpstation. A $1.85M agreement was signed with Encored to construct the microgrid. The SCADA system was expanded to monitor 85% of seawater flows. An additional 178kW of solar panels and a 100kW/400kWh energy storage system were installed. Trevi Systems was selected as the main contractor for the solar desalination project. A tenant satisfaction survey revealed high levels of satisfaction with NELHA services. Damage assessments were completed for buildings destroyed by the Kilauea eruption, and claims were submitted to FEMA and insurance companies for $7.6M. NELHA also resumed its semi-annual newsletter.

2020

NELHA successfully navigated the COVID-19 lockdown, maintaining strong tenant relations and implementing strict safety protocols. No staff infections were reported. FEMA approved a $3.447M grant for Puna building damage, and an additional $3M was secured from insurance companies. These funds will be used to expand the fully occupied research campus by engaging a planning and design firm.

2021

HOST Park has significantly improved energy efficiency, with a 4.43% increase in seawater system efficiency and a 15% overall boost from automation. A 10-year renewable energy and microgrid plan is underway, and consultants are working on decommissioning old pipelines. The microgrid project is nearing completion. The aquaculture accelerator program has secured a $3.1M grant for a four-year extension. The 9-acre Innovation Village expansion is in progress. HOST Park aims to lead Hawaii's ocean economy in energy, food security, technology, and conservation.

2022

NELHA successfully pumped over eight billion gallons of seawater during the pandemic, supporting over 50 businesses. Ten new clients joined HOST Park, with nearly 100% occupancy at times, accelerating the need for new research space. A new business leased the Gateway Center. $2.0M in CIP funding was received for EIS updates and offshore freshwater seep exploration. NELHA's organizational structure was overhauled to improve efficiency and effectiveness.

2023

NELHA completed the initial phase of PV and battery system testing for the 55" Pump Station Microgrid Project. The aquaculture accelerator 5.0 cohort was launched. A $3.4M CIP funding request was submitted for seawater system upgrades and an EIS for an offshore research corridor. The old Destiny Deep Seawater LLC building and improvements were purchased for $4.75M. A marine CSEM study was initiated with UH to identify submarine freshwater reservoirs. NELHA also launched a "pathways" workforce development program with local high schools.

2024

The 55" Pump Station PV/ESS Microgrid is completed, featuring 500kW solar ground-mounted PV array and 750 kWh of energy storage. NELHA launches hostpark.io detailing client success stories, unique resources and opportunities for investment, research and partnership. NELHA consults with an advisory hui to help guide through cultural issues. NELHA retrieves 200ft.-long abandoned pipe found floating in Keahole Point. Start of a three-year process to update the HOST Park and NELHA Master Plan. When complete, these documents will better enable NELHA to fulfill its mission. NELHA celebrates 50 years and hosts an Open House celebration with more than 1,700 in attendance.

HOST PARK

Natural Energy Laboratory of Hawaii Authority

hostpark.io | nelha.hawaii.gov