



UHERO

THE ECONOMIC RESEARCH ORGANIZATION  
AT THE UNIVERSITY OF HAWAII

NELHA REPORT

## ECONOMIC IMPACT OF THE NATURAL ENERGY LABORATORY HAWAII AUTHORITY TENANTS ON THE STATE OF HAWAII IN 2022

Prepared for Natural Energy Laboratory Hawaii Authority

JANUARY 11, 2024





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**Economic Impact of the Natural Energy Laboratory Hawaii Authority Tenants  
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**Prepared for**

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## EXECUTIVE SUMMARY

The Natural Energy Laboratory Hawaii Authority (NELHA) is a state agency that operates a unique and innovative ocean science and technology park in Kailua-Kona on the island of Hawaii. NELHA's assets include office and laboratory facilities, infrastructure, pristine natural resources, and leasable open land for use by tenant research, education, and commercial projects.

NELHA contracted the University of Hawaii Economic Research Organization (UHERO) to estimate its economic impact on the State of Hawaii. Specifically, this research determined NELHA's contribution to local business sales, employee earnings, tax revenues, and number of jobs in Hawaii from the expenditures of its tenants in 2022.

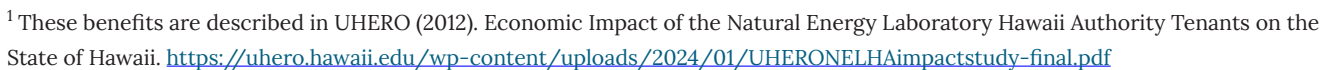
To estimate expenditures made by NELHA tenants in 2022, UHERO researchers developed a survey where expenditures were broken down into 17 named categories and one catch-all category (other). Respondents were asked to provide total expenditures in 2022 and the share of these expenditures that were paid to Hawaii vendors. UHERO received responses from 31 NELHA tenants (out of 45). Expenditure levels for the survey non-respondents were estimated using various techniques. 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\$). This growth is against a backdrop of a 2.6% contraction in the Hawaii economy during this same time period.

Following a standard approach, UHERO defined economic impact to be the direct, indirect, and induced economic activities generated by the tenant's spending in the Hawaii economy. The latest 20-sector State Input-Output (I-O) model (year 2017) of the State of Hawaii prepared by the Hawaii Department of Business, Economic Development and Tourism (DBEDT) was used to evaluate these impacts. The impact of NELHA's in-state expenditures in 2022 on the State's output (sales), earnings, and tax revenues was estimated to be \$145.4, \$37.8, and \$7.0 million respectively. Furthermore, not only do NELHA tenants employ hundreds of people but their expenditures also contribute to hundreds of other jobs in the larger Hawaii economy (714 total including the 17 NELHA employees).



The Natural Energy Laboratory Hawaii Authority (NELHA) contracted the University of Hawaii Economic Research Organization (UHRO) to estimate its economic impact on the State of Hawaii. NELHA currently accommodates 45 tenants ranging from companies bottling deep sea water to producing aquaculture and developing renewable energy technologies (See Figure 1 for a selected list of clients). These tenants pay over \$2.5 million in rent and royalties directly to NELHA. In addition, they employ hundreds of people, purchase goods and services from local businesses, and invest in capital improvements at NELHA.

**Figure 1. Selected list of NELHA Clients (as of November 2022)**



## BACKGROUND ON NELHA

NELHA's mission statement 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."

NELHA is a state agency that operates a unique and innovative ocean science and technology park in Kailua-Kona on the island of Hawaii. NELHA's assets include office and laboratory facilities, infrastructure, pristine natural resources, and leasable open land for use by tenant research, education, and commercial projects. A dual-temperature seawater system that is the only one of its kind in the world sets NELHA apart from all other technology parks and creates a prime setting for innovation and new industry development in this island coastal setting. NELHA aims to attract tenants of all types – research, educational, and commercial entities. Numerous innovative research projects have been completed at NELHA in the past and spawned new commercial enterprises that are established and successful businesses today. A public charter school was created at NELHA to take advantage of the many resources of this growing ocean science and technology community. A new federally funded facility, the NELHA Gateway project, provides a setting for leading edge research and development in distributed energy resources and renewable energy technologies, and a new commercial Ocean Center development that will provide opportunities for new ocean-related businesses.

## METHODOLOGY

This study uses standard empirical research methods to assess the economic impact of NELHA to the state of Hawaii. The essential steps conducted include survey design, data collection from the survey, data processing, and input-output analysis.

The survey design used for this study is identical to the survey conducted by UHERO researchers for the latest calendar year 2018. To facilitate data collection, expenditures were broken down into 17 named categories and one catch-all category (other). Respondents were asked to provide the total expenditures in 2022 rounded to the nearest thousand dollars and the share of these expenditures that went to Hawaii vendors. Tenants were given the option to submit their responses online using Survey Share or via hardcopy. A copy of the expenditure survey of NELHA tenants is included in the Appendix.

Of the 45 tenants, 31 responded.<sup>2</sup> For the 14 tenants who did not complete the survey, NELHA provided to UHERO the rent and utility payments they made to NELHA and an estimate of the number of workers for each of these tenant's total revenue (which UHERO assumed to equal total expenditures) and share of expenditures in Hawaii. Using these data, UHERO estimated these tenant's expenditures using one of two techniques.

For three of the 14 tenants who did not complete the survey, UHERO first identified a tenant who has a similar type of business and had filled in a survey. Then UHERO filled in all data except labor, utility, and rent payments for these three tenants by assuming their profile of expenditures was identical to the similar company we identified. NELHA reports the utility and rent payments and an estimate of the number of employees for all 14 tenants. To translate the number of employees into payments to labor, UHERO assumed each worker's salary equaled the State's average salary of \$61,420.<sup>3</sup> For each of these three entities, UHERO computed their expenditures in all categories except labor, rent, and utilities as the product of each entity's residual expenditures (total expenditures less labor, rent, and utility expenditures) and the ratio of the similar entity's expenditures on each category to its residual expenditures. To arrive at in-state expenditures for these categories, UHERO used NELHA's estimate for the share of expenditures that were in-state and multiplied it by the total expenditures for each of these categories.

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<sup>2</sup> Compared to 2018, the response rate was 12 percentage points higher.

<sup>3</sup> [https://www.bls.gov/oes/current/oes\\_hi.htm#00-0000](https://www.bls.gov/oes/current/oes_hi.htm#00-0000)

For the remaining eleven tenants, UHERO assigned the total expenditures to the following categories: rent, utilities, labor, and unspecified. First, total expenditures were reduced by rent and utilities to arrive at a residual for labor and unspecified. The amount of money that was assigned to labor equals the minimum of the residual and the product of NELHA's estimate for the number of workers and average wage rate. In the event that total labor bill exceeded the residual, the labor bill was reduced to the value of the residual. In which case, the value of payments to labor, rent, and utilities equaled the value of total expenditures. On the other hand, if the residual exceeded the labor bill then the difference of the residual and the labor bill was inputted into the unspecified category. In this case, payments to labor, rent, utility, and unspecified categories equaled the value of total expenditures. The method of assigning the expenditures to categories outside of labor, rent, and utilities is highly uncertain. But by using the weighted average multipliers, this technique should minimize any systematic error.

The largest sources of uncertainty for these tenants who failed to complete a survey are the estimates of their total expenditures and the share of in-state expenditures. However, since the estimated total expenditures from these tenants represents less than 5% of the total expenditures and 7% of the in-state expenditures, the errors from these estimates are unlikely to significantly affect the overall results and conclusions.

Table 1 reports the final survey results in terms of number of surveys and total expenditures by tenants who completed and did not complete a survey.

**Table 1: Final survey results (Tenants and Total Expenditures)**

| Tenant Category   | Tenants<br>(#) | Expenditures<br>(million 2022\$s) |                 |
|---|----------------|-----------------------------------|-----------------|
|   |                | In-State                          | Total           |
| Tenants who completed a survey  | 31             | \$84.69                           | \$141.68        |
| Tenants whose expenditures were estimated based on tenants with a similar business          | 3              | \$3.11                            | \$3.88          |
| Tenants whose expenditures were estimated based on rent, utilities, and number of employees | 11             | \$2.52                            | \$2.87          |
| <b>Total</b>  | <b>45</b>      | <b>\$90.33</b>                    | <b>\$148.42</b> |

## RESULTS

The total expenditures of NELHA tenants were computed by summing expenditures across tenants within each category. A tenant's expenditures to Hawaii vendors equal its total expenditures in a given category multiplied by the indicated share of expenditures in that category that went to Hawaii vendors. Then we summed local expenditures for each category across all tenants to arrive at total expenditures by all tenants for each category to Hawaii vendors. The analysis was performed on these aggregate data so that no individual tenant could be identified, therefore maintaining anonymity.

To compute the economic impacts of NELHA tenants' expenditures, one must convert the in-state retail level expenditure data collected from the surveys into producer level expenditures by industry categories identified in the Department of Business, Economic Development and Tourism's (DBEDT) 2017 condensed Input-Output (I-O) transactions table.<sup>4</sup> This conversion must be done since all transactions in the DBEDT I-O model are valued at producer prices. Therefore, the economic multipliers that are used to estimate economic impacts are based on producer level rather than retail level data.

<sup>4</sup> [https://dbedt.hawaii.gov/economic/reports\\_studies/2017-io/](https://dbedt.hawaii.gov/economic/reports_studies/2017-io/)

In converting NELHA tenants' expenditures into producer level expenditures, we closely follow the methodology used and described in the 2012 NELHA Impact study.<sup>5</sup> Table 2 reports producer level expenditures for each category, as well as retail and wholesale sector expenditures.

NELHA tenants spent about \$148.4 million on the categories below. Of these expenditures approximately 61% went to in-state entities.

**Table 2: Estimated total and in-state expenditures by NELHA tenants (millions of 2022\$s)**

| Expenditure category    | Total           | In-State       |
|-------------------------|-----------------|----------------|
| Rent                    | \$9.67          | \$9.14         |
| Professional services   | \$18.08         | \$10.33        |
| Financial & Insurance   | \$5.46          | \$2.47         |
| Business Services       | \$4.90          | \$0.85         |
| Equipment               | \$10.44         | \$4.30         |
| Materials               | \$21.72         | \$8.66         |
| Utilities               | \$8.59          | \$8.23         |
| Information             | \$0.94          | \$0.30         |
| Transportation services | \$8.97          | \$3.74         |
| Repair & Maintenance    | \$2.11          | \$1.40         |
| Government              | \$1.70          | \$1.20         |
| Other Travel            | \$0.48          | \$0.16         |
| Accommodations          | \$0.55          | \$0.29         |
| Eating & Drinking       | \$0.04          | \$0.04         |
| Retail                  | \$2.09          | \$0.37         |
| Unspecified             | \$3.12          | \$1.13         |
| Labor                   | \$49.55         | \$37.73        |
| <b>Total</b>            | <b>\$148.42</b> | <b>\$90.33</b> |

<sup>5</sup> For the description see: UHERO. (2012). Economic Impact of the Natural Energy Laboratory Hawaii Authority Tenants on the State of Hawaii. <https://uhero.hawaii.edu/wp-content/uploads/2024/01/UHERONELHAimpactstudy-final.pdf>

Producer price expenditures equal retail price expenditures less retail, wholesale, and transportation margins.<sup>6</sup> Table 3 below reports the retail, wholesale, and transportation margins applied to expenditure categories.

**Table 3: Retail, transportation, and wholesale margins for personal consumption expenditures<sup>7</sup>**

| Expenditure Category    | Retail Margin | Wholesale Margin | Transportation Margin |
|-------------------------|---------------|------------------|-----------------------|
| Rent                    | 0%            | 0%               | 0%                    |
| Professional services   | 0%            | 0%               | 0%                    |
| Financial & Insurance   | 0%            | 0%               | 0%                    |
| Business Services       | 0%            | 0%               | 0%                    |
| Equipment               | 0%            | 3%               | 26%                   |
| Materials               | 33%           | 3%               | 6%                    |
| Utilities               | 0%            | 0%               | 0%                    |
| Information             | 0%            | 0%               | 0%                    |
| Transportation services | 35%           | 0%               | 8%                    |
| Repair & Maintenance    | 0%            | 0%               | 0%                    |
| Government              | 0%            | 0%               | 0%                    |
| Other Travel            | 0%            | 0%               | 0%                    |
| Accommodations          | 0%            | 0%               | 0%                    |
| Eating & Drinking       | 0%            | 0%               | 0%                    |
| Retail                  | 0%            | 0%               | 0%                    |
| Unspecified             | 0%            | 0%               | 0%                    |

The DBEDT tables on margins are broken out by commodity (e.g., computers, groceries, drugs, etc.). For example, “Equipment” is generally purchased through wholesalers and was viewed to be mainly for durable goods, therefore for the wholesale component, we used DBEDT’s margins for “Miscellaneous Durable Equipment” and zero margins for the retail component. Expenditure category “Materials”, on the other hand, was assigned both wholesale and retail margins. Since “Materials” do not cleanly fall in any of the DBEDT’s specified commodity categories, we mapped it to the “All other merchandise” category (that has retail margin of 0.331 and wholesale margin of 0.063). Transportation margins, which include truck, air, and water transportation types, were applied to both equipment and materials. Rent, financial and insurance products, utility payments, information services, repair & maintenance, and professional services were paid directly to the providers of these goods and services. Therefore, no margins were associated with these categories.

<sup>6</sup> Appendix C in Department of Business, Economic Development and Tourism (DBEDT). (2022). The Hawaii State Input-Output Study: 2017 Benchmark report. [https://files.hawaii.gov/dbedt/economic/reports/IO/2017\\_state\\_io\\_study.pdf](https://files.hawaii.gov/dbedt/economic/reports/IO/2017_state_io_study.pdf)

<sup>7</sup> Ibid.



Using these margins, we compute each category's expenditures on the retail, wholesale, and transportation sectors. These three expenditures are subtracted from the category's retail level expenditures to compute the category's producer level expenditures. Then the retail, wholesale, and transportation expenditures from each sector are summed to compute the total expenditures on the retail, wholesale, and transportation sector.

Next, to apply the 2017 multipliers, we mapped the expenditures from the categories in our survey to the 20 condensed industry sectors identified in the DBEDT 2017 I-O study. Table 4 shows how the survey categories map into the corresponding industry sectors.

**Table 4: Concordance of survey categories with DBEDT industrial sectors**

| <b>Survey Categories</b> | <b>Industry Sectors<br/>(number and name)</b> |
|--------------------------|---|
| Rent                     | 11 Real estate and rentals                    |
| Equipment                | 4 Other Manufacturing                         |
| Financial & Insurance    | 10 Finance and insurance                      |
| Materials                | 4 Other Manufacturing                         |
| Utilities                | 7 Utilities                                   |
| Information              | 6 Information                                 |
| Transportation           | 5 Transportation                              |
| Repair & Maintenance     | 19 Other services                             |
| Professional services    | 12 Professional services                      |
| Travel (Air & Ground)    | 5 Transportation                              |
| Travel (Lodging)         | 17 Accommodations                             |
| Other Travel             | 13 Business Services                          |
| Eating & Drinking        | 18 Eating & Drinking                          |
| Retail                   | 9 Retail Trade                                |
| Unspecified              | Weighted State Avg.                           |
| Government               | 20 Government                                 |

Table 5 shows the resulting expenditures for all sectors. This table also converts expenditures on labor to personal consumption expenditures or the amount of labor earnings spent on in-state goods and services.

**Table 5: In-state producer level expenditures as well as retail and wholesale expenditures by DBEDT sectors (millions of 2022\$s)**

| Industry Sector                    | In-State Expenditures (millions of 2022\$s) |
|------------------------------------|---|
| Real estate and rentals            | \$9.14                                      |
| Other Manufacturing                | \$8.06                                      |
| Finance and insurance              | \$2.47                                      |
| Utilities                          | \$8.23                                      |
| Information                        | \$0.30                                      |
| Transportation                     | \$2.50                                      |
| Other services                     | \$1.01                                      |
| Professional services              | \$10.33                                     |
| Repair & Maintenance               | \$1.40                                      |
| Accommodation                      | \$0.29                                      |
| Eating & Drinking                  | \$0.04                                      |
| Government                         | \$1.20                                      |
| Retail trade                       | \$4.56                                      |
| Wholesale trade                    | \$1.94                                      |
| Unspecified                        | \$1.13                                      |
| PCEs                               | \$31.76                                     |
| <b>Total in-state expenditures</b> | <b>\$84.35</b>                              |

A substantial portion of labor earnings (\$37.7 million) will be injected back to the economy in the form of household purchases of goods and services. Personal consumption expenditures (PCEs) may be treated as an additional producing sector. The conversion ratio between labor earnings and PCEs is calculated using the 2017 I-O Transaction Table for Hawaii and equals 84.2%, indicating that about 84.2% of employee's earnings are spent in the local economy. This suggests that of the \$37.7 million of labor earnings, approximately \$31.8 million will be spent in the Hawaii economy.

The expenditures in Table 5 correspond to a direct effect of NELHA tenants on the Hawaii economy. For example, NELHA tenants spent a total of roughly \$10.3 million directly on professional services. The professional services sector in turn spent some of these expenditures on Hawaii goods and services. This indirect action leads to a multiplier effect. In addition, there is an induced effect that refers to the changes in household spending that result from changes in earnings through direct and indirect effects.

In other words, for every dollar spent, the direct effect is the original dollar, the indirect effect is the additional spending by industries created by that dollar, and the induced effect is the additional spending by households in the economy from increased income as a result of that original dollar spent.

To evaluate the short-term impact of tenant expenditures in 2022 on the State of Hawaii, we used Type II multipliers from DBEDT's 2017 20-sector I-O model. The Type II multipliers are widely used in real-world applications, as they capture the direct, indirect, and induced effects per dollar of spending in each sector of the economy. The impacts were computed by multiplying the expenditures by their respective type II multipliers to arrive at output, earnings, state tax, and jobs as shown in Table 6.

**Table 6: 2017 Condensed Output, Earnings, State Tax, and Employment Type II Multipliers for Hawaii<sup>8</sup>**

| Industry                          | Output | Earnings | State Tax | Jobs (per million \$s of expenditures) |
|-----------------------------------|--------|----------|-----------|--|
| Real estate and rentals           | 1.55   | 0.23     | 0.06      | 4.45                                   |
| Other Manufacturing               | 1.34   | 0.20     | 0.03      | 3.69                                   |
| Finance and insurance             | 2.16   | 0.54     | 0.11      | 10.02                                  |
| Utilities                         | 1.69   | 0.31     | 0.07      | 4.45                                   |
| Information                       | 1.84   | 0.39     | 0.08      | 6.24                                   |
| Transportation                    | 1.89   | 0.50     | 0.08      | 9.43                                   |
| Other services                    | 2.18   | 0.80     | 0.14      | 15.59                                  |
| Professional services             | 2.21   | 0.81     | 0.14      | 12.98                                  |
| Repair & Maintenance              | 2.37   | 0.80     | 0.12      | 15.81                                  |
| Accommodation                     | 2.17   | 0.57     | 0.17      | 8.91                                   |
| Eating & Drinking                 | 2.17   | 0.66     | 0.12      | 15.78                                  |
| Government                        | 1.84   | 0.79     | 0.08      | 11.87                                  |
| Retail trade                      | 1.85   | 0.55     | 0.11      | 13.22                                  |
| Wholesale trade                   | 1.88   | 0.50     | 0.07      | 7.91                                   |
| Weighted Average                  | 1.93   | 0.57     | 0.10      | 12.67                                  |
| Personal Consumption Expenditures | 1.58   | 0.42     | 0.08      | 8.20                                   |

The product of these multipliers and the producer level expenditures yields the economic impact of NELHA on Hawaii's economy in 2022. For example, the output multiplier for "Real estate and rentals" is 1.55. This means that every \$1 change in "Real estate and rentals" final demand changes the economy's total output (or sales) by \$1.55. This includes the direct effect of the initial dollar change (\$1.00) plus the combined indirect and induced effects of \$0.55. Hence, the contribution to output from the rental income paid by tenants is found by multiplying the "Real estate and rental expenditures" (\$9.1 million dollars) by the "Output" multiplier for this sector (1.55), which yields a contribution of \$14.2 million dollars.

Table 7 reports impacts of NELHA tenants' in-state expenditures on state output, earnings, taxes, and employment by industry.<sup>9</sup> These estimates can be interpreted for the state as a whole or industry-by-industry. For example, take the transportation industry. NELHA tenants collectively spent \$2.5 million in this individual sector. The impact on Hawaii's larger economy from NELHA's spending on the transportation industry was \$4.7 million in output (sales), \$1.3 million in employee earnings, \$190,000 in additional state taxes, and 24 additional jobs. The total state impact from all of NELHA's spending was an increase of \$145.4 million in output (sales), \$37.8 million in earnings, \$7.0 million in increased state taxes, and 697 additional jobs. In other words, every million dollars spent by NELHA tenants created over 8 jobs in 2022 in Hawaii.

<sup>8</sup> Table 2.1 in Department of Business, Economic Development and Tourism (DBEDT). (2022). The Hawaii State Input-Output Study: 2017 Benchmark report. [http://files.hawaii.gov/dbedt/economic/reports/IO/2017\\_state\\_io\\_study.pdf](http://files.hawaii.gov/dbedt/economic/reports/IO/2017_state_io_study.pdf)

<sup>9</sup> Column totals may differ slightly from the sum of the reported row values due to rounding. The state taxes in the 2017 I-O (Table 25) include the following 13 categories: (1) general excise and use tax (accounted for about 48.2% of total state taxes), (2) individual income tax (30.4%), (3) corporate income tax (0.6%), (4) transient accommodations tax (6.7%), (5) fuel tax (2.7%), (6) alcohol and tobacco tax (2.9%), (7) PUC tax (1.6%), (8) insurance tax (2.3%), (9) unemployment compensation tax (1.4%), (10) motor vehicle tax/fees (2.5%), (11) conveyance tax (1.1%), (12) bank and other financial institutions tax (0.2%), and (13) licenses, permits, and others (0.01%). Excluded from state taxes were property taxes, other city and county taxes, and federal taxes.

**Table 7: Initial expenditures and total economic impacts (millions of 2022\$s and Jobs)**

| Industry                | In-state expenditures |                 | Impact on Hawaii's |               |            |
|-------------------------|-----------------------|-----------------|--------------------|---------------|------------|
|                         |                       | Output          | Earnings           | State Taxes   | Jobs (#)   |
| Real estate and rentals | \$9.14                | \$14.17         | \$2.09             | \$0.57        | 41         |
| Other Manufacturing     | \$8.06                | \$10.77         | \$1.59             | \$0.23        | 30         |
| Finance and insurance   | \$2.47                | \$5.34          | \$1.33             | \$0.27        | 25         |
| Utilities               | \$8.23                | \$13.92         | \$2.53             | \$0.56        | 37         |
| Information             | \$0.30                | \$0.56          | \$0.12             | \$0.03        | 2          |
| Transportation          | \$2.50                | \$4.72          | \$1.25             | \$0.19        | 24         |
| Other services          | \$1.01                | \$2.20          | \$0.81             | \$0.14        | 16         |
| Professional services   | \$10.33               | \$22.85         | \$8.31             | \$1.44        | 134        |
| Repair & Maintenance    | \$1.40                | \$3.31          | \$1.11             | \$0.16        | 22         |
| Accommodation           | \$0.29                | \$0.64          | \$0.17             | \$0.05        | 3          |
| Eating & Drinking       | \$0.04                | \$0.10          | \$0.03             | \$0.01        | 1          |
| Government              | \$1.20                | \$2.20          | \$0.94             | \$0.10        | 14         |
| Retail trade            | \$4.56                | \$8.45          | \$2.49             | \$0.49        | 60         |
| Wholesale trade         | \$1.94                | \$3.64          | \$0.97             | \$0.14        | 15         |
| Unspecified             | \$1.13                | \$2.18          | \$0.64             | \$0.11        | 14         |
| PCEs                    | \$31.76               | \$50.33         | \$13.42            | \$2.47        | 261        |
| <b>Total</b>            | <b>\$84.35</b>        | <b>\$145.37</b> | <b>\$37.81</b>     | <b>\$6.96</b> | <b>697</b> |

NELHA's economic impact on Hawaii's state economy expanded significantly from 2018 to 2022, with total output rising from \$122 million in 2018 to \$145 million in 2022 (in 2022 dollars). During this period, earnings, tax revenues, and job growth increased by 25%, 23%, and 20%, respectively. This growth occurred despite the COVID pandemic's negative impact on the state's economy, where real gross state product decreased by 2.6%, and payroll jobs fell by 6.1%. Like other sectors of Hawaii's economy that were not hit hard by the COVID pandemic, economic activity at NELHA served as a stabilizing force during these difficult times.

Table 8 reports the total expenditures, in-state expenditures, and output for 2018 and 2022. The annual growth rate in real dollars for these metrics is, respectively, 8.5%, 4.8%, and 4.9%. These growth rates occurred while Hawaii's economy shrank at an annual rate of 0.66% (i.e., the average annual change in Hawaii's gross state product was -0.66%).



**Table 8: Total Expenditures, In-State Expenditures, and Output for the Years 2018 and 2022 (millions of nominal and 2022 dollars)**

|                       | 2018<br>(millions \$s) | 2022<br>(millions \$s) | Annualized Growth Rate (%) |
|-----------------------|------------------------|------------------------|----------------------------|
| Total Expenditures    |                        |                        |                            |
| Nominal \$s           | 92                     | 148                    |                            |
| Real 2022\$s          | 107                    | 148                    | 8.5%                       |
| In-State Expenditures |                        |                        |                            |
| Nominal \$s           | 65                     | 90                     |                            |
| Real 2022\$s          | 75                     | 90                     | 4.8%                       |
| Output                |                        |                        |                            |
| Nominal \$s           | 104                    | 145                    |                            |
| Real 2022\$s          | 120                    | 145                    | 4.9%                       |

Interestingly, the share of in-state expenditures fell from 73% in 2013 to 70% in 2018 to 61% in 2022. This drop in the share may suggest that Hawaii's economy is becoming less diversified so companies must look to out-of-state vendors and suppliers for the products and services that they need. If the percentage of total NELHA tenants expenditures for in-state entities returned to the 2018 levels, the impact on the Hawaii economy would be over \$170 million in output, exceeding NELHA's contribution to Hawaii's output in 2013 measured in 2022\$s.

## SUMMARY

We obtained expenditures data for calendar year 2022 for 31 NELHA tenants (out of 45). The expenditure levels for the survey non-respondents were estimated using various techniques. Total NELHA tenant expenditures were estimated at \$148 million, of which about \$90.3 million (or 61%) were paid to Hawaii entities.

The in-state expenditures provided many economic benefits to the state of Hawaii. Using the DBEDT multipliers, we estimated the impact of NELHA in-state expenditures on the State's output (sales), earnings, and tax revenues to be \$145.4, \$37.8, and \$7.0, respectively. Furthermore, not only do NELHA tenants employ hundreds of people but also their expenditures contribute to 697 jobs in the larger Hawaii economy.

Finally, the State government helps support some of NELHA's operations through appropriated CIP funds for site development, and from monies from the State's general fund. Over the past ten years, NELHA has received on average about \$2 million per year. One way to look at the State's return on these expenditures is to consider the ratio of the total impact on output less the government's expenditures (\$145.4 million - \$2.3 million) to government expenditures (\$2.3 million), which yields a leverage of about \$62.2 per state dollar. In other words, every dollar of state expenditures toward NELHA results in over \$62.2 of output generated in the Hawaii economy. This can be compared to the leverage of other State-funded agencies, for example the University of Hawaii at Manoa. UHERO estimated UHM's leverage in fiscal year 2012 to be approximately \$11.4 per state dollar.<sup>10</sup>

<sup>10</sup> "The Contribution of the University of Hawaii at Manoa to Hawaii's Economy in 2012," (Jan. 2013) <https://uhero.hawaii.edu/wp-content/uploads/2020/10/UHEROEconomicImpactofUHManoa.pdf>

## Appendix: NELHA Tenant Survey

| Category                       | Description and Examples   | Total CY 2022<br>Expenditures<br>(to the nearest<br>thousand \$) | % of Total<br>CY 2022<br>Expenditures<br>to Hawaii<br>Businesses |
|--------------------------------|--|--|--|
| Salaries and wages             | Salaries and wages paid to employees or contractors. Do not include fringe.  |  |  |
| Employee benefits              | Fringe benefit payments, expenditures for business and employee insurance coverage, employee benefit programs and services. Do not include FICA.   |  |  |
| FICA taxes                     | Federal Insurance Contributions Act  |  |  |
| Rent                           | Rental expenses paid to NELHA, rental of facilities, equipment, vessels, cars, etc.  |  |  |
| Equipment                      | Expenditures for capital purchases - durable goods, equipment, motor vehicles, furniture, construction materials, metals and minerals (except petroleum), laboratory equipment, scientific instruments, etc.; include raw and intermediate materials and supplies used in production |  |  |
| Supplies                       | Office supplies, consumables, minor equipment  |  |  |
| Information                    | Internet, Telecommunications, Broadcasting   |  |  |
| Utilities                      | Electricity, gas, water (if paid separately from rent)   |  |  |
| Professional services          | Expenditures for services such as accounting and payroll; computer support; consulting; research; advertising, engineering, architectural, etc.  |  |  |
| Financial & Insurance services | Investment management services, expenditures for interest on loans or leasing arrangements   |  |  |
| Business services              | Waste management and remediation services; security and surveillance services, cleaning  |  |  |
| Transportation                 | Expenditures to transport materials and equipment via air, water, truck, rail, etc.; include warehousing and storage en route  |  |  |
| Repair & Maintenance           | Equipment and machinery repairs and maintenance  |  |  |
| Taxes                          | Payroll taxes other than FICA, real property taxes, income taxes, import taxes   |  |  |

| Category | Description and examples   | COLUMN A  | COLUMN B   |
|----------|--|---|--|
|          |  | Total CY 2022<br>Expenditures (to the<br>nearest thousand \$) | % of Total CY 2022<br>Expenditures<br>to Hawaii<br>Businesses* |
| Travel   | Expenditures for airfare, lodging, meals & incidentals paid on behalf of employees and others such as event participants, invited guests, etc.<br>Please provide total and a breakdown of lodging costs and airfare/ground transportation as % of the total travel expenditures. |   |  |
|          | <b>Total travel</b>  |   |  |
|          | Lodging (%)  | (% of the total travel)                                       | (% of column A to HI vendors)                                  |
|          | Airfare/gr transportation (%)  | (% of the total travel)                                       | (% of column A to HI vendors)                                  |
| Other    | (Please describe)  |   |  |

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THE ECONOMIC RESEARCH ORGANIZATION  
AT THE UNIVERSITY OF HAWAII

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