UHERO

THE ECONOMIC RESEARCH ORGANIZATION
AT THE UNIVERSITY OF HAWAIʻI

PREPARED FOR:
NATURAL ENERGY LABORATORY HAWAII AUTHORITY

Economic Impact of the Natural Energy Laboratory Hawaii Authority Tenants on the State of Hawaii

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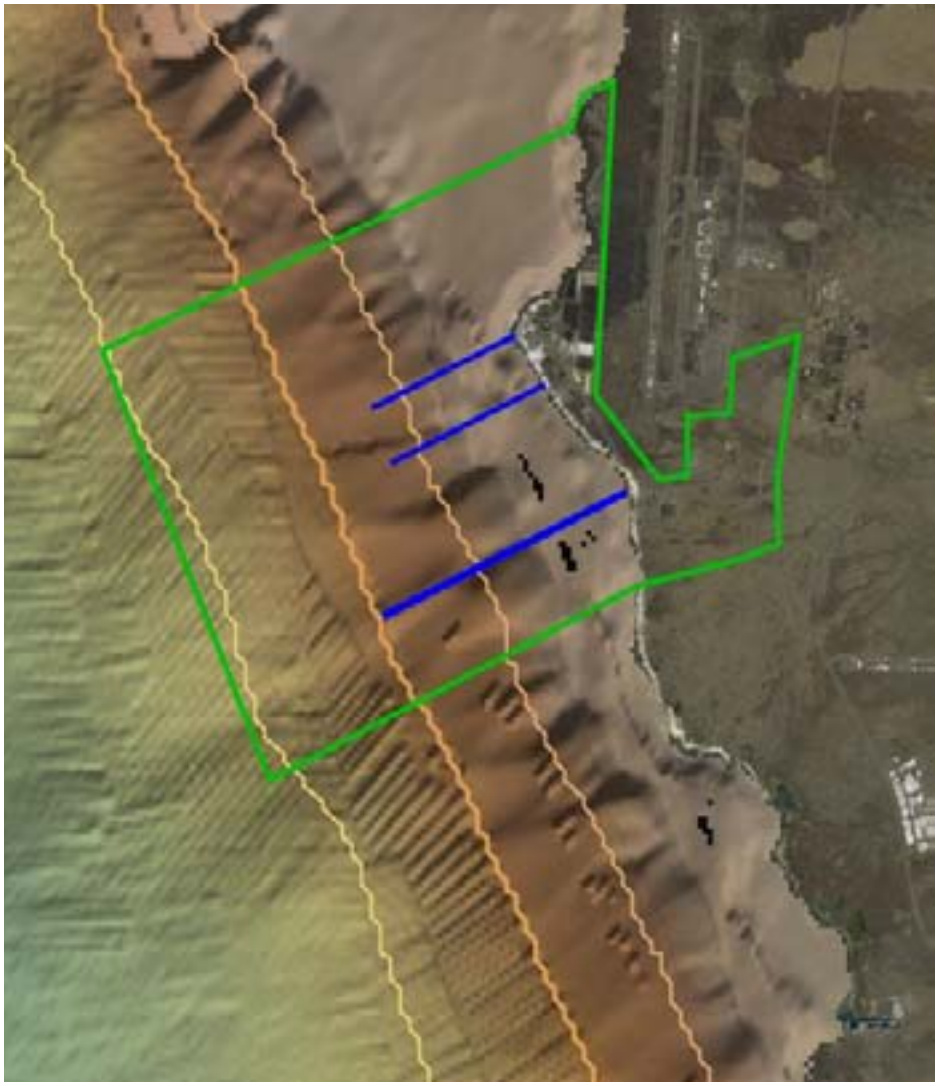
NELHA



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

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COVER PHOTOGRAPHY (CLOCKWISE FROM UPPER LEFT): 1) NEW CHARTER SCHOOL CAMPUS FOR WEST HAWAII EXPLORATIONS ACADEMY, 2) SOPOGY'S CONCENTRATED SOLAR POWER RESEARCH & DESIGN CENTER, 3) ILLUSTRATION OF OFFSHORE DEEP SEA PIPELINES

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 2010.

To estimate expenditures made by NELHA tenants in 2010, UHERO researchers developed a survey where expenditures were broken down into 11 named categories and respondents were asked to provide total expenditures in 2010 and the share of these expenditures that were paid to Hawaii vendors. UHERO received responses from 23 NELHA tenants (out of 41). These expenditures represented 85% of total expenditures made by NELHA tenants in 2010. Expenditure levels for the survey non-respondents we estimated using various techniques. Total NELHA tenant expenditures were estimated at $81.0 million, of which approximately $49.6 million (or 58%) were paid to Hawaii entities.

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 2007 20-sector Inter-County input-output (I-O) model of the State of Hawaii prepared by the Hawaii Department of Business, Economic Development and Tourism was used to evaluate these impacts. The estimated impact of NELHA's in-state expenditures in 2010 on the State's output (sales), earnings, and tax revenues was estimated to be $87.7, $24.7, and $4.5 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 (583 total, including NELHA employees). Finally, NELHA receives on average about $2 million per year from the State. One way to look at the State's return on these expenditures is to consider what the state's investment has provided in terms of the net impact from NELHA. Each dollar the state invests yields a leverage of about $42.8. In other words, every dollar the State spends on NELHA generates $42.8 of output in the Hawaii economy. (For a comparison, the UHM's leverage calculated by UHERO for the fiscal year 2007 was approximately $5.34 per state dollar.)

Finally, NELHA provides additional benefits to the state of Hawaii that this study does not capture but are important to consider when evaluating NELHA's overall footprint on the economy. Over a quarter of NELHA's tenants are involved in research activities. The research activities and in some cases education components contribute to Hawaii through investment in human capital and knowledge spillovers, which are important in a budding technology and innovation community. An increase in the research intensity has a large impact on the share of high value added occupations in a community. Hence, an important payoff from research activities is the types of jobs it creates within the economy. These are highly skilled, highly productive, engaged citizens that benefit the community.

Introduction

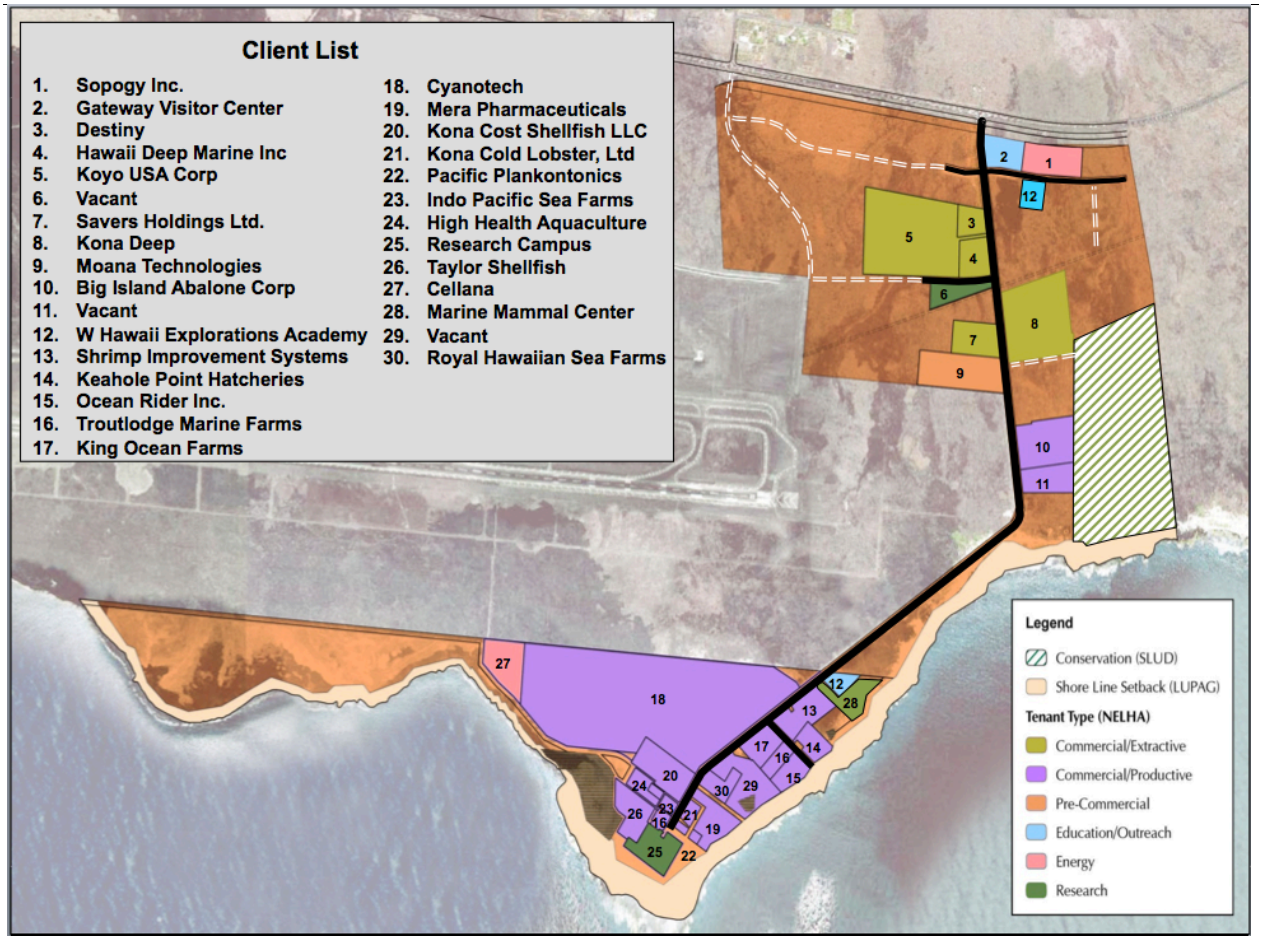
The Natural Energy Laboratory Hawaii Authority (NELHA) contracted the University of Hawaii Economic Research Organization (UHERO) to estimate its economic impact on the State of Hawaii. NELHA currently accommodates 41 tenants ranging from companies bottling deep sea water to solar and biofuel companies. These tenants pay close to $4 million in rent, royalties and pass through expense directly to NELHA. In addition, they employ hundreds of people, purchase goods and services from local businesses, and invest in capital improvements at NELHA.

This research determines NELHA's contribution to local business sales, employee earnings, tax revenues, and number of jobs in Hawaii from the expenditures of its tenants in 2010. NELHA provides additional benefits to the state of Hawaii that this study does not capture but are important to consider when evaluating NELHA's overall footprint on the economy.

NELHA tenants employ over 300 people. Among them 36% (or 117 employees) work for tenants who are either in research or education-related fields. Over a quarter of NELHA's tenants are involved in research activities. For example, larger research-oriented entities at NELHA are Cellana Inc. – a developer of algae-based biofuels and bio-products; Moana Technologies LLC focuses on research and development in biotechnology; University of Hawaii- Infrasound Laboratory provides and develops technical expertise in the field of low-frequency acoustics and conducts research into acoustic source processes. The research and in some cases education components of many of these tenants contribute to Hawaii through investment in human capital and knowledge spillovers, which are important in a budding technology and innovation community. For example, the National Defense Center of Excellence for Research in Ocean Sciences (CEROS) solicits and supports innovative technologies for national maritime military applications and sustained technology-based economic development in Hawaii. Since 1993, CEROS alone has funded 270 projects for a total over $107 million. In 2010, about 90% of these contracts were allocated to researchers in Hawaii.

Abel and Deitz (2009) find a strong connection between a metropolitan area's research intensity and the presence of high human capital occupations.[1] Although the study is based on an assessment of the link between degree production and R&D activities of colleges and universities and the amount and types of human capital present in the metropolitan areas where the institutions are located, it is likely that these spillover effects will be also observed for the R&D activities concentrated outside of academia. Abel and Deitz's research indicates that R&D activities can raise local human capital levels by increasing both the supply of and demand for skill. An increase in the research intensity has a large impact on the share of high value added occupations in a community. Hence, an important payoff from research activities is the types of jobs it creates within the economy. These are highly skilled, highly productive, engaged citizens that benefit the community.

[1] Jaison R. Abel and Richard Deitz, 2011. Do colleges and universities increase their region's human capital? *Federal Reserve Bank of New York Staff Reports*, no.401, October 2009; revised March 2011



Selected client list

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 began as "NELH" in 1974 when the Hawaii State Legislature created the Natural Energy Laboratory of Hawaii on 322 acres of land at Keahole Point. NELH was mandated to provide a support facility for research on the ocean thermal energy conversion (OTEC) process and its related technologies.

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, will provide 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. The essential steps conducted include survey design, data collection from the survey, manipulation of survey data, and input-output analysis.

Survey Design

To estimate expenditures made by NELHA tenants in 2010, UHERO researchers developed a survey. To facilitate data collection and in an effort to not burden respondents with too large of a data request, expenditures were broken down into 11 named categories and respondents were asked to provide the total expenditures in 2010 rounded to the nearest thousand dollars and the share of these expenditures that went to Hawaii vendors. Table 1 reflects a copy of the expenditure survey sent to all NELHA tenants.

Table 1: Expenditure survey sent to all NELHA tenants

Category	Description and examples	Total payments in 2010	Share of total expenditures made to **Hawai'i vendors** (%)
Rent	Rental expenses paid to NELHA; Rental of equipment, vessels, cars, etc.		
Financial & Insurance	Expenditures associated with investment management, insurance and employee benefit funds; Interest rates payments on loans		
Equipment	Capital, durable goods, any kind of equipment (motor vehicles, furniture, equipment, laboratory equipment, scientific instruments, etc.).		
Materials	Raw and intermediate materials and supplies used in production. Construction materials, metals and minerals (e.g., CO2, lubricants, nutrients, etc.).		
Utilities	Electricity, gas, sea water, fresh water (*if paid separately from rent*)		
Information	Internet, Telecommunications, Broadcasting		
Transportation	Travel expenses (e.g. air, water, truck and rail, etc.) including fuel if separate; Warehousing and storage		
Labor	Wages paid to employees or contractors;		
Repair & Maintenance	Equipment and machinery repairs and maintenance		
Professional services	All kinds of professional services (legal; accounting and payroll services; computer services; consulting services; research services; advertising services)		
Other	(Please describe)		

These categories were chosen to facilitate data collection and analysis. These categories map well the 2007 twenty sector input-output table of the State of Hawaii prepared by the Hawaii Department of Business, Economic Development and Tourism (DBEDT).

Data Collection – Administration of the survey

We emailed the survey to all NELHA tenants and asked them to return a completed survey within two to three weeks. After three weeks, only ten tenants had returned completed surveys. NELHA and UHERO sent additional emails and made phone calls in an attempt to have the rest of the tenants complete and submit the survey.

We stopped soliciting survey responses after a third or fourth round of calls and emails. Of the 41 surveys we mailed, we received 23 completed surveys. NELHA had income statements for four of the tenants who did not complete our survey. Thus we have hard data for 27 of the 41

tenants. Of the remaining 14, based on consultation with NELHA, half were deemed relatively small and therefore, we excluded their income from our analysis. For the other half, NELHA estimated their income. The expenditure estimation process is explained in detail in the next section. Table 2 reports the final survey results in terms of number of surveys and total expenditures by tenants who completed and did not complete a survey. The estimated expenditures (i.e., expenditures from tenants who did not complete a survey) represents about one sixth of the total expenditures.

Table 2: Final survey results

Tenant Category	Tenants (#)	Expenditures (million 2010$s)
Tenants who completed a survey	**23**	**$68.8**
Tenants who did not complete a survey	**18**	**$12.2**
Tenants for whom NELHA had an income statement	4	
Tenants whose income was estimated by NELHA	10	
Tenants whose income was deemed to be relatively small	4	
Total (including the Center of Excellence for Research and Ocean Sciences)	**41**	**$81.0**

Data manipulation – Filling in missing data

We employed two methods depending on the information that we had to estimate expenditures for tenants who did not submit our expenditure survey. For tenants for whom we had income statements, we assumed that their total income equaled their total expenditures. We then divided their total expenditures across the ten categories (excluding category "Other") based on a tenant with a similar type of business activity (i.e., similar NAICS code) for whom we had a completed survey. We assumed that the share of expenditures that went to Hawaii entities was the same as the share of the similar tenant for which we have data.

For tenants for whom we did not have income statements, we relied on NELHA for its best guess as to their expenditures. For small entities, we split their expenditures among rent (1/6), materials (1/3), and labor (1/2). We assumed 100% of the expenditures on rent and labor went to Hawaii entities, but only 50% of the expenditures on materials went to local entities. For larger entities, we picked a tenant with a similar business profile and created an expenditure vector with similar shares.

The use of an income statement in the missing data imputation process has a considerable shortcoming. A tenant's income statement may not reflect its actual expenditures (i.e. total income is not equal to total expenditures). An income statement is a financial document that illustrates how much a company earns or loses during the year. It is calculated as a difference between revenue and expenses. High income, hence, is determined by a relative magnitude of

revenues and expenditures. For example, high income does not necessarily mean high expenditures (e.g., it is possible if revenues are high and the costs are low). This means that without additional information income per se may not be a good predictor of expenditures.

To test the sensitivity of our assumption, we compared the total income from the income statements with the total expenditure data for tenants for whom we had information for both indicators. For these tenants these statistics were, on average, roughly equivalent.

Computation of Total Expenditures

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 share of expenditures in this category that went to Hawaii vendors. Then we summed expenditures for each category across all tenants to arrive at total expenditures by all tenants for each category. The analysis was performed on these aggregate data so that no individual tenant could be identified, therefore maintaining anonymity.

Results: Economic Impacts

This section reports the economic impact of NELHA's tenant expenditures in 2010 on the State of Hawaii. We define economic impact to be the direct, indirect, and induced economic activities generated by the chosen categories of expenditures. The economic impacts are expressed in terms of business sales (output and earnings), employment, labor income, and state and local taxes.

We used the 2007 20-sector input-output (I-O) model of the State of Hawaii to evaluate the short-term impact of tenant expenditures in 2010. The model was used to quantify the economic impact of NELHA expenditures on individual industries. The impacts were computed by multiplying the expenditures by their respective "type II multipliers" to arrive at total sales, employment, earnings impacts, and jobs impacts. Type II multipliers capture the direct, indirect, and induced effects per dollar of spending in each sector of Hawaii's economy. These can be thought of as the "ripple" effects of initial spending related to NELHA.

Our process of computing of the economic impacts of NELHA on the state of Hawaii included several steps. We begin with the aggregated survey results and make a number of computations to arrive at the final impacts. This section discusses the computations and reports the final impacts.

The expenditure data that we collected can be thought of as reflecting values at the retail level since all purchases were presumably made at the retail level. Table 3 reports the aggregated retail level expenditure data for all NELHA tenants. The expenditures are reported by the categories provided in the survey.

Table 3: Estimated total and in-state expenditures by NELHA tenants (millions of 2010$s)

Expenditure category	Total	In-State
	(millions of 2010$s)	
Rent	$2.5	$2.4
Equipment	$9.6	$3.1
Financial & Insurance	$6.5	$5.0
Materials	$18.9	$5.3
Utilities	$4.3	$4.3
Information	$0.3	$0.2
Transportation	$2.9	$1.4
Repair & Maintenance	$2.7	$2.3
Professional services	$16.7	$10.0
Government	$0.4	$0.4
Labor	$16.3	$15.2
Total	$81.0	$49.6

NELHA tenants spent about $81.0 million on the categories above. Of these expenditures more than 50% went to in-state entities.

To compute the economic impacts of NELHA tenant's expenditures, one must convert the in-state retail level expenditure data collected from the surveys into producer level expenditures by industry categories identified in DBEDT's 2007 condensed I-O transactions table. 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.

Producer price expenditures equal retail price expenditures less retail, wholesale, and transportation margins.[2] Table 4 below reports the retail, wholesale, and transportation margins applied to expenditure categories.

[2] Appendix C in "The Hawaii State Input-Output Study: 2007 Benchmark report," Department of Business, Economic Development, and Tourism, July 2011.

Table 4: Retail, transportation, and wholesale margins for personal consumption expenditures[3]

Expenditure category	Retail Margin	Wholesale Margin	Transportation Margin
Rent	0%	0%	0%
Equipment	0%	26%	3%
Financial & Insurance	0%	0%	0%
Materials	33%	6%	3%
Utilities	0%	0%	0%
Information	0%	0%	0%
Transportation	35%	8%	0%
Repair & Maintenance	0%	0%	0%
Professional services	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.

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. Table 5 reports these results.

[3] Ibid.

Table 5: Producer level expenditures for each category as well as retail and wholesale sector expenditures (millions of 2010$s)

Expenditure category	In-State (millions of 2010$s)
Rent	$2.4
Equipment	$2.2
Financial & Insurance	$5.0
Materials	$3.1
Utilities	$4.3
Information	$0.2
Transportation	$1.1
Repair & Maintenance	$2.3
Professional services	$10.0
Government	$0.4
Retail	$2.2
Wholesale	$1.2
Total	**$34.4**
Labor	*$15.2*
Total expenditures including labor	**$49.6**

Next, to apply the 2007 condensed multipliers, we need to map the expenditures from the categories in our survey to 20 industry sectors identified in the DBEDT 2007 Input-Output study. Table 6 shows how the survey categories map into the corresponding industry sectors.

The substantial portion of labor earnings ($15.2 million) will be injected back to the economy in the form of household purchases of goods and services. We convert tenants' expenditures on labor using the personal consumption expenditures (PCEs). PCEs may be treated as an additional producing sector. The conversion ratio between labor earnings and PCEs is calculated using the 2007 Condensed Input-Output Transaction Table for Hawaii and equals 85.4% indicating that about 85% of employee's earnings are spent in the local economy. This suggests that $15.2 million of labor earnings will create approximately $13.0 million of additional spending in the economy.

Table 6: Concordance of survey categories with DBEDT industrial sectors

Survey Categories	Industry Sectors (number and name)
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
Government	20 Government

Using concordance reported in Table 6, we arrive at the following retail expenditures by sector (see Table 7).

Table 7: In-state producer level expenditures by DBEDT Industries (millions of 2010$s)

Industry	In-State Expenditures
Real estate and rentals	$2.4
Other Manufacturing	$5.3
Finance and insurance	$5.0
Utilities	$4.3
Information	$0.2
Transportation	$1.1
Other services	$2.3
Professional services	$10.0
Government	$0.4
Retail	$2.2
Wholesale	$1.2
Personal consumption expenditures	$13.0
Total in-state expenditures	**$47.3**

The expenditures in Table 7 correspond to a direct effect of NELHA tenants on the Hawaii economy. For example, NELHA tenants spent a total of $10.0 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. Since we want to capture the direct, indirect, and induced effects of expenditures on Hawaii economy, we use the Type II multipliers. Additionally, the Type II multipliers are more widely used in real-world applications.

$$\text{Type II multiplier} = \frac{\text{Direct effect + Indirect effect + Induced effect}}{\text{Direct effect}}$$

To summarize, 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.

Table 8 reports output, earnings, state tax, and employment Type II multipliers that were used in this analysis.

Table 8: 2007 Condensed Output, Earnings, State Tax, and Employment Type II Multipliers for Hawaii[4]

Industry	Output	Earnings	State Tax	Jobs (per million $s of expenditures)
Real estate and rentals	1.55	0.20	0.06	6.1
Other Manufacturing	1.49	0.20	0.03	4.6
Finance and insurance	2.17	0.57	0.10	12.9
Utilities	1.72	0.24	0.07	4.4
Information	1.74	0.45	0.08	9.5
Transportation	2.00	0.51	0.08	12.4
Other services	2.27	0.81	0.12	22.9
Professional services	2.15	0.86	0.14	17.6
Government	1.90	0.84	0.09	16.4
Retail trade	1.90	0.56	0.11	17.0
Wholesale trade	1.91	0.61	0.07	12.8
PCEs	1.65	0.46	0.08	12.1

[4] Ibid.

The product of these multipliers and the producer level expenditures yield the economic impact of NELHA on Hawaii's economy in 2010. 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" ($2.4 million) by the "Output" multiplier for this sector (1.55), which yields a contribution of $3.7 million. Table 9 reports impacts of NELHA tenants in-state expenditures on state output, earnings, taxes, and employment by industry.[5]

Table 9: Initial expenditures and total economic impacts (millions of 2010$s and Jobs)[6]

Industry	Initial in-state expenditures (millions of 2010$s)	Impact on Hawaii's			
		Output	Earnings	State Taxes	Jobs
		(millions of 2010$s)			(#)
Real estate and rentals	$2.4	$3.7	$0.5	$0.2	15
Other Manufacturing	$5.3	$7.8	$1.0	$0.2	24
Finance and insurance	$5.0	$10.8	$2.8	$0.5	64
Utilities	$4.3	$7.3	$1.0	$0.3	19
Information	$0.2	$0.4	$0.1	$0.0	2
Transportation	$1.1	$2.2	$0.6	$0.1	13
Other services	$2.3	$5.2	$1.8	$0.3	52
Professional services	$10.0	$21.5	$8.6	$1.4	177
Government	$0.4	$0.8	$0.3	$0.0	7
Retail trade	$2.2	$4.2	$1.2	$0.3	38
Wholesale trade	$1.2	$2.4	$0.8	$0.1	16
PCEs	$13.0	$21.4	$ 6.0	$1.1	157
Total	**$47.3**	**$87.7**	**$24.7**	**$4.5**	**583**

[5] Column totals may differ slightly from the sum of the reported row values due to rounding. The state taxes in the 2007 I-O include the following 13 categories: (1) general excise and use tax (accounted for about 50.4% of total state taxes), (2) individual income tax (28.7%), (3) corporate income tax (1.5%), (4) transient accommodations tax (4.2%), (5) fuel tax (3.2%), (6) alcohol and tobacco tax (2.6%), (7) PUC tax (2.3%), (8) insurance tax (1.7%), (9) unemployment compensation tax (2.0%), (10) motor vehicle tax/fees (2.1%), (11) conveyance tax (0.9%), (12) bank and other financial institutions tax (0.4%), and (13) licenses, permits, and others (0.01%). Excluded from state taxes were property taxes, other city and county taxes, and federal taxes.

[6] Total in-state expenditures reported in Tables 7 and 9 are smaller than total expenditures in Table 5 because not all labor income is consumed locally. Labor expenditures of $15.2 million lead to $13.0 million in PCEs.

Table 9 can be interpreted for the state as a whole or industry-by-industry. For example, take the transportation industry. NELHA tenants collectively spent $1.1 million in this individual sector. The impact on Hawaii's larger economy from NELHA's spending on the transportation industry was $2.2 million in output (sales), $600,000 in employee earnings, $100,000 in additional state taxes, and 13 additional jobs. The total state impact from all of NELHA's spending was an increase of $87.7 million in output (sales), $24.7 million in earnings, $4.5 million in increased state taxes, and 583 additional jobs.

Hawaii Ocean Science and Technology (HOST) Park before and after development

Summary

Using a new survey, we obtained expenditures data for 23 NELHA tenants (out of 41). These expenditures represented 85% of the total expenditures made by NELHA tenants in 2010. The expenditure levels for the survey non-respondents we estimated using various techniques. As result the total NELHA tenant expenditures were estimated at $81.0 million, of which about $49.6 million (or 58%) 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 $87.7, $24.7, and $4.5 million, respectively. Furthermore, not only do NELHA tenants employ hundreds of people but also their expenditures contribute to over 583 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 ($87.7 million - $2 million) to government expenditures ($2 million), which yields a leverage of about $42.8 per state dollar. In other words, every dollar of state expenditures toward NELHA results in over $42.8 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 2007 to be approximately $5.34 per state dollar.[7]

[7] The contribution of the University of Hawai'i at Manoa to Hawai'i's Economy in 2007, http://www.uhero.hawaii.edu/products/view/19