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DEPT. COMM. NO. 470

DTS 202308171114LA

August 29, 2023

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

The Honorable Scott K. Saiki,
Speaker and Members of the
House of Representatives
Thirty-second State Legislature
State Capitol, Room 431
Honolulu, Hawaii 96813

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

For your information and consideration, I am transmitting a copy of the *Report on Hawaii Tax Credit for Research Activities for Tax Year 2022*, as required by Act 261, Hawaii Revised Statutes, 2019. 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,

For James Kunane Tokioka

Enclosure

c: Legislative Reference Bureau

Report on

Hawai‘i Tax Credit for Research Activities

for Tax Year 2022

August 2023

Department of Business, Economic Development and Tourism

State of Hawai‘i

This report fulfills the reporting requirements of Section 235-110.91, Hawai‘i Revised Statutes (Act 261, Session Laws of Hawai‘i 2019) and was prepared by the Research and Economic Analysis Division headed by Dr. Eugene Tian, Division Administrator. The report was prepared by Dr. Yang-Seon Kim, Research and Statistics Officer.

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Executive Summary

- This report fulfills the reporting requirements of Section 235-110.91, Hawai‘i Revised Statutes (Act 261, Session Laws of Hawai‘i 2019). The purpose of this report is to provide a summary of characteristics and activities of the Qualified High Technology Businesses (QHTBs) that applied for the Hawai‘i tax credit for research activities for the tax year 2022. It provides statistics for two groups of QHTBs; all QHTBs that applied for the credit and a subset of the QHTBs of which credits were certified.

- A total of twenty-six QHTBs applied for Hawai‘i tax credit for research activities for the tax year 2022 by submitting an executed Form N-346A. All the twenty-six QHTBs completed the application by submitting the required DBEDT survey.

- The twenty-six QHTBs spent a combined total of $59.4 million in research activities in Hawai‘i in 2022, of which 20% ($11.9 million) was claimed for the tax credit. Almost all the research spending (98%) was funded locally.

- DBEDT issued certificates to nine QHTBs, for a total of $5 million credit certified, on a first-come first-served basis verifying the information submitted. Two QHTBs were certified for a partial amount of the credit they claimed.

- Reflecting the changes made in the new law, the average amounts of credit claimed per QHTB under the new law were much larger than those for the 2013-2019 tax years. For the tax year 2022, the average credit claimed per QHTB was $0.46 million, even larger than $0.33 million and $0.39 million claimed per QHTB for the 2020 and 2021 tax year respectively. In comparison, the average tax credit per QHTB reported in the DBEDT survey for the tax years 2013-2019 was $0.11 million.

- The amount of credit claimed by individual QHTBs varied significantly, ranging from less than $5,000 to over $2 million. Among all QHTBs, five QHTBs (19.2%) claimed less than $50,000 and two of them were certified. On the other hand, there were five QHTBs (19.2%) who claimed over $1 million credit including one with over $2 million credit claimed. Three of the five QHTBs were certified, fully or partially, this year. The largest amount of credit certified for a QHTB this year was $1.5 million.

- The certified QHTBs tended to be larger than the average of all applicants in terms of research activities and the number of employees. The proportion of the nine certified QHTBs in total credit claimed and total employees hired was 52% and 51% respectively, larger than their proportion (35%) to the total number of applicants. The average revenue size of the

nine certified QHTBs was not larger than the overall average because of one large, certified mainland-based company whose Hawai‘i operation consists of research and development only with no revenue generated.

- There were five QHTBs (one of them were certified) that provided a business address outside Hawai‘i, which means that they are headquartered in an out-of-state location. Out-of-state addresses included California (2), Delaware (2), and Colorado (1)

- Many QHTBs that applied for this year's tax credit had a long history of doing business as more than three quarters of the QHTBs were established before 2010. Regarding research activities, the majority of the QHTBs have been doing research for the entire history of their business.

- There were two mainland-based companies that reported over 13,000 patents owned by the companies as of 12/31/2022. Excluding the two exceptional companies, a total of 159 patents were owned or pending as of 12/31/2022 by the remaining twenty-four QHTBs, which is 6.6 patents per QHTB on average. Almost all of them, 95%, originated in Hawai‘i. However, owning at least a patent was not something that was shared by all companies. About half of the QHTBs didn't own even a single patent; 53.8% of all applicants and 44.4%of the nine certified QHTBs.

- 'Information and Communication Technology' sector was the most popular business sector among the QHTBs with eleven QHTBs doing business in the sector. Of the certified QHTBs, 'Biotechnology/Life Sciences' was the most popular sector, followed by the 'Information and Communication Technology' and 'Agricultural Biotechnology' sector.

- The twenty-six QHTBs generated a total of $262.4 million revenue from all goods and services produced in Hawai‘i, spent a little less amount, $227.9 million, as operating cost including $101.1 million paid as payroll. That was $10.1 million revenue, $8.8 million operating cost, and $3.9 million payroll expense per QHTB on average. However, the survey showed a wide spectrum of businesses including a company with no revenue to companies with over thirty million dollars of annual revenue.

- Overall dependence of the QHTBs on out-of-state sales was relatively high. More than a third of the combined revenue of the twenty-six QHTB's were from out-of-state sales. However, dependence on out-of-state sales varied significantly by QHTB. QHTBs were either highly dependent on out-of-state sales or not dependent at all, with not many QHTBs in the middle. Over half of the QHTBs sold all their Hawai‘i produced goods and services locally with no out-of-state sales while about a third of the QHTBs sold more than 80% of

Hawai‘i produced goods and services to out-of-state markets. The sales of the nine certified QHTBs were mostly for local demand with less than 5% of their combined revenue being generated from out-of-state sales.

- Dependence of their revenue on intellectual property-based sales showed a similar pattern. QHTBs were either highly dependent on intellectual property-based sales or not dependent at all. Among the twenty-five revenue-generating QHTBs in the tax year 2022, seven QHTBs made more than 80% of their revenue from the intellectual property produced in Hawai‘i, while seventeen QHTBs had no intellectual property-based revenue. For the nine certified QHTBs, intellectual property-based sales were only 3.4% of their combined revenue.

- As of December 12, 2022, a total of 1,008 employees were working in a regular position at the twenty-six QHTBs. Most of them, 94.6%, were full-time employees. Since the condition to be a QHTB is to conduct more than 50% of its activities in qualified research the proportion of research jobs was high at the QHTBs. About two in three regular employees were employed for research activities.

- About a third of full-time employees at the twenty-six QHTBs were paid at least $100,000 annually with the average annual wage at $88,612. While this average wage was higher than the average wage of many other sectors in Hawai‘i, the wage level of each QHTB was diverse. Of twenty-three QHTBs that had at least one full time employee and reported their average annual wage in the survey, seven QHTBs had an average annual wage of $100,000 or higher while six QHTBs reported an average annual wage under $75,000.

- In aggregate, the number of jobs at the twenty-six QHTBs in 2022 showed a small decrease from the prior year. At the individual company level, however, the job performance was mixed showing no clear sign of positive impacts of the research tax credit on job creation in high-tech companies. While nine QHTBs experienced a job decrease, there were nine QHTBs with no change in jobs and six QHTBs who experienced an increase in jobs.

- Among the twenty-six QHTBs, seventeen QHTBs (65%) reported that they hired independent contractors or procured external services in 2022. They spent a combined total of $16.5 million to hire or procure a total of 358 contractors or external services for jobs performed in Hawai‘i. About half of the spending, 53.9%, was made in ‘Scientific and Technical Contract Services’ area.

- To assess spill-over effects of QHTBs’ research activities on other companies in Hawai‘i the survey asked if there was any new company established to commercialize the intellectual property owned by the QHTBs. No new company was reported to be established in 2022.

Table S1. Summary statistics on the characteristics and activities of QHTBs

	All QHTBs	Certified QHTBs
Number of QHTBs	26	9 [1]
% of QHTBs with a Hawai‘i business address	81%	89%
Research		
Research expense incurred in Hawai‘i (aggregate)	$59.4M	$31.0M
per QHTB	$2.3M	$3.4M
% funded from out-of-state sources	1.8%	0.3%
Tax credit claimed (aggregate)	$11.9M	$6.2M [2]
per QHTB	$0.46M	$0.69M
-QHTBs with credit “Under $100K”	34.6%	33.3%
-QHTBs with credit “$100K-$500K”	30.8%	22.2%
-QHTBs with credit “$500K-$1M”	15.4%	11.1%
-QHTBs with credit “$1M or over”	19.2%	33.3%
Tax credit certified (aggregate)	$5M	$5M
Top research area	Computer software	Biotechnology
Patents (owned or filed)		
-QHTBs with “0” patent	53.8%	44.4%
-QHTBs with “1-10” patents	23.1%	11.1%
-QHTBs with “over 10” patents	23.1%	44.4%
Revenue/Expense		
Revenue (aggregate)	$262.4.7M	$81.0M
per QHTB	$10.1M	$9.0M
% of revenue from out of state sales	39.5%	4.2%
% of revenue from intellectual properties	29.8%	3.4%
Operation expenses (aggregate)	$227.9M	$75.3M
Capital expenditure (aggregate)	$5.3M	$0.8M
Employment [3]		
Number of employees (aggregate)	1,008	511
per QHTB	38.8	56.8
Research jobs as % of total jobs	62.3%	82.8%
Job changes from 2021		
-QHTBS with job “Increase”	25.0%	22.2%
-QHTBS with job “No change”	37.5%	33.3%
-QHTBS with job “Decrease”	37.5%	44.4%
Avg. annual wage of full-time employee		
Weighted average of QHTBs [4]	$88,612	$79,043
-QHTBs with avg. wage “Under $75K”	23.1%	33.3%
-QHTBs with avg. wage “$75K- $99.9K”	38.5%	33.3%
-QHTBs with avg. wage “$100K- $149.9K”	15.4%	33.3%
-QHTBs with avg. wage “$150K or over”	11.5%	0.0%

1. Including two QHTBs of which claimed credit was partially certified
2. $6.2M were claimed by the nine certified QHTBs but $5M were certified due to $5M aggregate annual cap
3. Regular employees including both full-time and part-time. It doesn’t include temporary or seasonal jobs.
4. Weighted by the number of full-time employees at the QHTB.

1. Introduction

Many states have been implementing a state research tax credit in conjunction with the federal research tax credit, to further promote research activities of businesses in the state.

Hawai‘i’s effort to encourage research activities through tax incentives started as early as 1999. Act 178 in 1999 contained a state tax credit for research activities. However, the tax credit was limited to 2.5% of new research expenses in Hawai‘i and was non-refundable.

Benefits of the Hawai‘i research tax credit increased substantially in 2000, when Act 297 raised the Hawai‘i research tax credit from 2.5% to 20% of the qualified research expenses to match the federal standard and made the credit refundable. The controversial Act 221 in 2001 that increased the tax credit for investment in high technology industry to 100% of investment, augmented the benefit of the research tax credit as well by allowing the research credit to be claimed for all qualified research expenses, not just the incremental amount, while it remained refundable. Hawai‘i research tax credit was amended once more in 2004 when Act 215 limited credit eligibility to Qualified High Technology Businesses (QHTB) only. This old research tax credit sunset in 2010.

Act 270, Session Laws of Hawai‘i 2013, re-established Hawai‘i's research tax credit for the tax year from 2013 to 2019. The credit remained at 20% of the qualified research expenditures and continued to be refundable. However, it adopted federal rules again for eligibility, which means that qualified research expenses are limited to incremental amounts only. Act 270 also enhanced reporting requirements. It mandated all QHTBs that claimed the state research tax credit to complete an annual survey with the Hawai‘i Department of Business, Economic Development, and Tourism (DBEDT).

DBEDT submitted to the legislature seven annual reports for the tax years 2013-2019 with aggregated statistics on the activities of the QHTBs based on the survey results. Many QHTBs that claimed the tax credit during the period, however, interpreted the survey requirement as not mandatory that resulted in significant differences between the amount of the credit reported in the DBEDT survey and the amount of the credit claimed with the Hawai‘i Department of Taxation. Total amount of credits claimed with the Hawai‘i Department of Taxation for the tax years 2013-2019 was $18.8 million (an annual average of $2.7 million). The amount of credits reported in the DBEDT survey for the seven tax years was a total of $9.2 million (an annual

average of $1.3 million), which was about half of the actual amount claimed with the Hawai‘i Department of Taxation.

In 2019, the legislature passed Act 261, extending the research tax credit for five more years through December 31, 2024, with a few changes. As in Act 221 (2001), the amount of tax credit is determined without regard to the amount of expenses in previous years. Credit can be taken based upon all qualified research expenses incurred in Hawai‘i in that tax year. However, it requires all claims to be certified by DBEDT before it is claimed with the Hawai‘i Department of Taxation. It also established an annual credit cap of $5 million of the aggregated amount of certified credit per year.

This is the third report that was prepared pursuant to Act 261. The purpose of this report is to provide a summary of characteristics and activities of the QHTBs that applied for the Hawai‘i tax credit for research activities for the tax year 2022. This report includes statistics on various activities of QHTBs for two groups of QHTBs; all QHTBs that applied for the credit and a subset of the QHTBs of which credits were certified.

2. Summary of Tax Credit Certification

There are two requirements for a business to be eligible for the Hawai‘i tax credit for research activities. First, the business must be a Qualified High Technology Business (QHTB) by conducting more than 50% of its activities in qualified research. Second, it must claim the federal research tax credit under section 41 of the Internal Revenue Code. This section summarizes how many businesses applied and were certified for the Hawai‘i tax credit for research activities for the tax year 2022.

A total of twenty-six QHTBs applied for the Hawai‘i research activity tax credit for the tax year 2022 by submitting an executed Form N-346A by March 31st, 2023. All the twenty-six QHTBs completed the application by submitting the required DBEDT survey.

DBEDT issued a certificate to nine QHTBs on the first-come first-served basis verifying the information submitted. Seven QHTBs were certified for the full amount they claimed while two QHTBs were certified for a partial amount of the credit they claimed. Throughout this report, ‘all QHTBs’ or ‘all applicants’ refers to the twenty-six QHTBs that completed the application by

submitting the DBEDT survey, and the 'certified QHTB' refers to the nine certified QHTBs including the two QHTB of which claimed credit were partially certified.

Table 1. Application and certification of Hawai'i Research Tax Credit, tax year 2022

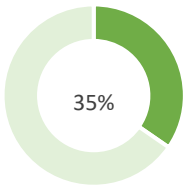
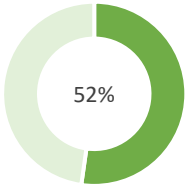
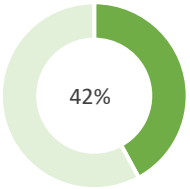
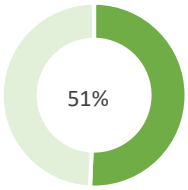
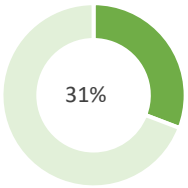
(Number of QHTBs)

QHTBs that submitted N-345A form to DBEDT	QHTBs that completed DBEDT survey	QHTBs of which claimed credit was certified		
		All	Fully certified	Partially certified
26	26	9	7	2

Although the size of the company was not a factor for certification, the certified QHTBs tended to be larger than the average of all applicants in terms of research activities and the number of employees. Figure 1 shows the share of the nine certified QHTBs among all twenty-six applicants in three major aspects of their business activities.

The proportion of the nine certified QHTBs in total credit claimed and total employees hired was 52% and 51% respectively, larger than their proportion (35%) to the total number of applicants. The average revenue size of the nine certified QHTBs was not bigger than the overall average because of one large, certified mainland-based company of which Hawai'i operation consists of research and development only with no revenue generated.

Figure 1. Share of the certified QHTBs among all applicants

Number of QHTBs	Credit claimed	Credit certified	Number of employees	Revenue
				
Among 26 QHTBs that applied for the tax credit, 9 QHTBs (35%) were certified. [1]	Among $11.9 M credit claimed by all 26 QHTBs, $6.2M (52%) were claimed by the 9 certified QHTBs	Among $11.9 M credit claimed by all 26 QHTBs, $5M were certified (due to $5M aggregate annual cap)	Combined number of employees at the 9 certified QHTBs consisted 51% of total employed by the 26 QHTBs.	Combined revenue of the 9 certified QHTBs consisted 31% of the combined reveneu of the 26 QHTBs

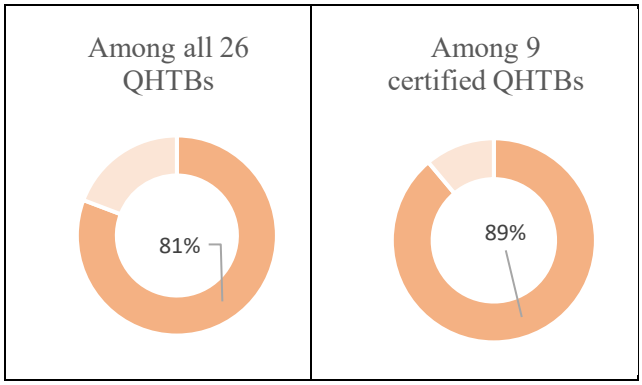
1. Two QHTBs were certified for a partial amount of the credit they claimed

3. Characteristics of QHTBs

Business location

There were five QHTBs (one of them were certified) that provided a business address outside Hawai‘i, which means that they were headquartered in an out-of-state location. Out-of-state addresses provided by those five QHTBs included California (2), Delaware (2), and Colorado (1).

Figure2. QHTBs with Hawai‘i business address



History of doing business and research

Many QHTBs that applied for this year's tax credit had a long history of doing business as more than three quarters of the QHTBs were established before 2010. There were four relatively new companies that were established in or after 2015, but none of them were certified this year.

Table 2. QHTBs by the year established

QHTBs	Year when it was established					
	all	1990 or before	1991-2000	2001-2010	2011-2020	2021 or after
All QHTBs (26)	100%	38.5%	15.4%	23.1%	23.1%	0.0%
Certified QHTBs (9)	100%	44.4%	22.2%	22.1%	11.1%	0.0%

Regarding research activities, the majority of the QHTBs have been doing research for the entire history of their business (77% of all QHTBs and 100% of the certified QHTBs). Only six out of the twenty-six QHTBs reported a research history much shorter than the history of their business.

Table 3. History of research activities

QHTBs	Years of doing research				
	all	1-5 years	6-10 years	11-20 years	More than 20 years
All QHTBs (26)	100%	7.7%	34.6%	15.4%	42.3%
Certified QHTBs (9)	100%	0.0%	11.1%	22.2%	66.7%

Intellectual properties

A total of 13,585 patents were reported to be owned or pending as of 12/31/2022 by all twenty-six QHTBs that applied for the tax credit this year. However, a caution is required here as 99% of them were reported by two mainland-based companies. Excluding the two exceptional companies, the total number of patents owned or pending as of 12/31/2022 by the remaining twenty-four QHTBs were 159, which is 6.6 patents per QHTB on average. Almost all of them, 95%, originated in Hawai‘i. The origin of a patent is determined by the residence of the first-named inventor.

Table 4. Aggregate number of patents owned or pending as of 12/31/2022

QHTBs	Patents as of 12/31/2022			Number of patents (owned or pending) originating in Hawai‘i [1]
	Owned or pending	Owned	Pending	
All QHTBS (26)	13,585	10,379	3,206	183
Certified QHTBs (9)	5,382	4.469	913	164
Excluding two QHTBs who owned 99% of total number reported above				
All QHTBS (26) – 2	159	55	104	151
Certified QHTBs (9) – 1	132	52	80	132

[1.] Patent origin is determined by the residence of the first-named inventor

Owning at least one patent was not something that was shared by all companies. Table 5 shows the distribution of the QHTBs by the number of patents owned by the company. About half of the QHTBs didn’t own even a single patent; 53.8% of all applicants and 44.4% of the nine certified QHTBs. On the other hand, there were six companies with more than 10 patents owned or pending as of 12/31/2022. Four of them were certified this year.

Table 5. QHTBs by the number of patents owned or pending as of 12/31/2022

Patents owned or pending	Among all QHTBs (26)		Among certified QHTBs (9)	
	Number of QHTBs	% of total	Number of QHTBs	% of total
0 (no patent)	14	53.8%	4	44.4%
1-10 patents	6	23.1%	1	11.1%
11-50 patents	3	11.5%	2	22.2%
51-100 patents	1	3.8%	1	11.1%
Over 100 patents	2	7.7%	1	11.1%

Business areas

The survey asked each QHTB to indicate all industry sectors where the QHTB conducted business in 2022. Eight major business sectors consisting of eighty-four sub-sectors were provided in the survey as business categories. By broad category, more than 80% of the QHTBs indicated that they conducted business only in one business sector. On the other hand, five QHTBs did business in more than one sector: three QHTBs doing business in all different sectors and two QHTBs doing business in two sectors but possibly related activities.

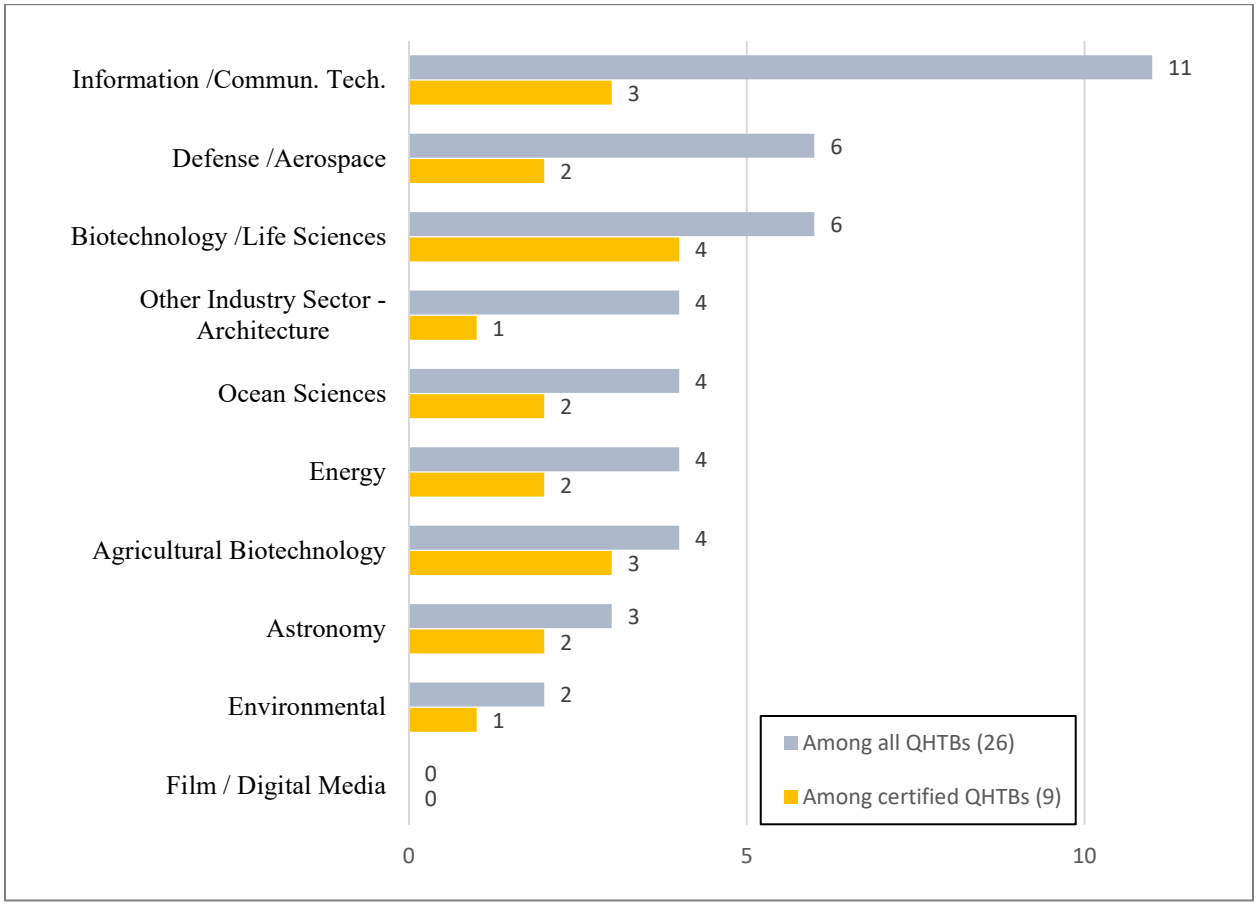
Table 6. Business areas of QHTBs in 2022

Business sectors		Number of QHTBs	
		Among all QHTBs (26)	Among certified QHTBs (9)
One sector only	Agricultural Biotechnology	2	1
	Biotechnology/Life Sciences	2	1
	Defense/ Aerospace	2	0
	Energy	1	0
	Information/ Communication Technology	9	2
	Ocean Sciences	2	1
	Other (Architecture)	3	1
Doing business in more than one sector		5	3

Figure 3 shows total numbers of QHTBs that conducted business in each industry sector in 2022, counting multi-sector company multiple times for all industry sectors they did business in. 'Information and Communication Technology' sector was the most popular business sector among the QHTBs with eleven QHTBs doing business in the sector. Among the certified QHTBs, 'Biotechnology/Life Sciences' was the most popular sector, followed by the 'Information and Communication Technology' and 'Agricultural Biotechnology' sector.

Table A-2 in the appendix at the end of this report shows business activities of the QHTBs by detailed business category. 'Specialty Software Development' in the 'Information/ Communication Technology' sector was the most prevalent business activity amongst the QHTBs with nine QHTBs doing business in this sub-sector in 2022. The next popular sub-sectors included 'Information Services' in the same sector and 'Architecture/Civil Engineering Design' with four QHTBs in each sub-sector.

Figure 3. Number of QHTBs that conducted business in each sector (with multiple counting) [1]



[1] Multi-sector companies were counted for all sectors where they did business.

4. Revenue and Spending Structure

Revenue structure

Table 7 presents the aggregate amount of revenue and expenses of the QHTBs for the tax year 2022. The twenty-six QHTBs generated a total of $262.4 million revenue from all goods and services produced in Hawai‘i, spent a little less amount, $227.9 million, as operating cost for goods and services produced in Hawai‘i including $101.1 million paid as payroll. That was $10.1 million revenue, $8.8 million operating cost, and $3.9 million payroll expense per QHTB on average. However, the survey showed a wide spectrum of businesses including a company with no revenue to companies with over thirty million dollars of annual revenue.

Table 7. Aggregate amount of revenue and expenses

Annual revenue/expenses [1]	All QHTBs (26)	Certified QHTBs (9)
Revenue	$262.4M	$81.0M
Operating cost	$227.9M	$75.3M
- Payroll expense [2]	$101.1M	$41.6M
Capital expenditures	$5.3M	$0.8M

[1] Earned from or incurred for all goods and services produced in Hawai‘i
[2] For employees requiring Hawai‘i W-2 form, including fringe benefits, health insurance, and employment taxes

Table 8. QHTBs by the size of revenue

Annual revenue [1]	Among all QHTBs (26)		Among certified QHTBs (9)	
	Number of QHTBs	% of total	Number of QHTBs	% of total
Under $100K [2]	1	3.8%	1	11.1%
$100K - $1M	5	19.2%	3	33.3%
$1M - $5M	9	34.6%	2	22.2%
$5M - $10M	2	7.7%	0	0.0%
Over $10M	9	34.6%	3	33.3%

[1] Earned from or incurred for all goods and services produced in Hawai‘i
[2] A QHTBs with research activity only in Hawai‘i with no revenue generated from its activities in Hawai‘i

Overall dependence of the QHTBs on out-of-state sales was relatively high. More than a third of the combined revenue of the twenty-six QHTB’s were from out-of-state sales. However, the

sales of the nine certified QHTBs were mostly for local demand with less than 5% of their combined revenue being generated from out-of-state sales.

Dependence of their revenue on intellectual property-based sales showed a similar pattern. While about a third of the combined revenue of the twenty-six QHTB's were from intellectual property-based sales, its share among the nine certified QHTBs' revenue was only 3.4% of their total revenue.

Table 9. Aggregate amount of revenue by source

Revenue (aggregate)	All QHTBs (26)		Certified QHTBs (9)	
	$ million	% of total revenue	$ million	% of total revenue
Total annual revenue	$262.4	100%	$80.8	100%
By source of revenue				
- from out-of-state sales	$93.2	35.5%	$3.4	4.2%
- from intellectual property	$78.1	29.8%	$2.7	3.4%
- from intellectual-property-based out-of-state sales [1]	$67.1	25.6%	$2.5	3.1%

Although the aggregate amounts presented in Table 9 help us to understand average behaviors of the QHTBs, they tend to be heavily weighted on the behaviors of large companies. Since dependence on out-of-state sales and intellectual property-based sales varied significantly by QHTB, diverse behaviors of individual QHTBs were examined in Table 10 and 11.

As presented in Table 10, the QHTBs were either highly dependent on out-of-state sales or not dependent at all, with not many QHTBs in the middle. Over half of the QHTBs (57.7% of all QHTBs and 55.6% of the certified QHTBs) sold all their Hawai‘i produced goods and services locally with no out-of-state sales. On the other hand, 30.8% of all QHTBs and 22.2% of the certified QHTBs sold more than 80% of Hawai‘i produced goods and services to out-of-state markets.

Similar patterns were observed in QHTBs' intellectual property-based sales. QHTBs were either highly dependent on intellectual property-based sales or not dependent at all. Among the twenty-five revenue-generating QHTBs in the tax year 2022, seven QHTBs made more than 80% of their revenue from the intellectual property produced in Hawai‘i while seventeen QHTBs had no intellectual property-based revenue.

Table 10. QHTBs by its dependence of revenue on out-of-state sales

Dependence of revenue on out-of-state sales or activities	Among all QHTBs (26)		Among certified QHTBs (9)	
	Number of QHTBs	% of total	Number of QHTBs	% of total
0%	15	57.7%	5	55.6%
20% or less	2	7.7%	1	11.1%
21-50%	0	0.0%	0	0.0%
51-80%	0	0.0%	0	0.0%
Over 80%	8	30.8%	2	22.2%
NA (no revenue)	1	3.8%	1	11.1%

Table 11. QHTBs by its dependence of revenue on intellectual property-based sales

Dependence of revenue on intellectual property-based sales or activities	Among all QHTBs (26)		Among certified QHTBs (9)	
	Number of QHTBs	% of Total	Number of QHTBs	% of total
0%	17	65.4%	5	55.6%
20% or less	1	3.8%	0	0.0%
21-50%	0	0.0%	0	0.0%
51-80%	0	0.0%	0	0.0%
Over 80%	7	26.9%	3	33.3%
NA (no revenue)	1	3.8%	1	11.1%

Hawai‘i expenses of QHTBs

Twenty-six QHTBs spent a combined total of $233.2 million in 2022 as operating expenses or capital expenditures for sales and activities performed in Hawai‘i.

Table 12 presents where the QHTBs made the spending in 2022. By detailed categories, ‘Specialty Software Development’ and ‘Ocean Engineering’ subsector received $77.3 million and $38.2 million respectively, accounting for about half of total spending made by the twenty-six QHTBs. Spending by the certified QHTBs was also concentrated in two sub-sectors. More than 60% of the combined spending of $76.1 million by the nine certified QHTBs occurred either in the ‘Seed Propagation/Seed Corn’ or ‘Ocean Engineering’ sub-sector.

Table 12. Areas where QHTBs spent their operating and capital expense in 2022

Sector	All QHTBs (26)		Certified QHTBs (9)	
	$ million	% of total	$ million	% of total
All sectors	**$ 233.2**	**100.0%**	**$ 76.1**	**100.0%**
Information/Communication Technology	**$ 93.5**	**40.0%**	**$ 0.7**	**0.9%**
- Specialty Software Development	$ 77.3	33.1%	$ 0.7	0.9%
- Testing & Evaluation	$ 8.3	3.6%		
- Telecommunications/Networks	$ 3.1	1.3%		
- Information Services	$ 3.1	1.3%		
- Other	$ 1.7	0.7%		
Ocean Science	**$ 38.2**	**16.4%**	**$ 21.8**	**28.7%**
- Ocean Engineering	$ 38.2	16.4%	$ 21.8	28.7%
Environmental	**$ 32.8**	**14.1%**		
- Other	$ 27.3	11.7%		
- Water Technologies	$ 4.0	1.7%		
- Soil Technologies	$ 1.5	0.7%		
Agricultural Biotechnology	**$ 25.1**	**10.8%**	**$ 25.1**	**33.0%**
- Seed Propagation/Seed Corn	$ 25.1	10.8%	$ 25.1	32.9%
- Aquaculture	$ 0.07	0.03%	$ 0.07	0.1%
Biotechnology/Life Sciences	**$ 14.4**	**6.2%**	**$ 8.0**	**10.5%**
- Healthcare Facility	$ 6.0	2.6%		
- Biologics/Vaccines	$ 5.2	2.2%	$ 5.2	6.8%
- Bioinformatics/Biophotonics	$ 1.5	0.6%	$1.5	1.9%
- Other (Nutraceuticals)	$ 1.3	0.6%	$ 1.3	1.7%
- Medical Devices	$ 0.3	0.1%	$ 0.03	0.04%
- Healthcare IT	$ 0.1	0.04%		
Defense/Aerospace	**$ 11.0**	**4.7%**	**$ 6.2**	**8.1%**
- Other	$ 4.5	1.9%		
- Remote Sensing	$ 4.4	1.9%	$ 4.1	5.4%
- Testing & Evaluation	$ 1.5	0.7%	$ 1.5	2.0%
- Photonics	$ 0.5	0.2%	$ 0.5	0.7%
- Communication & Computer system	$0.1	0.04%		
Energy	**$ 2.2**	**0.9%**	**$ 1.4**	**1.8%**
- Energy Efficiency	$ 1.4	0.6%	$ 1.4	1.8%
- Waste-to-Energy	$ 0.8	0.3%		
Astronomy	**$ 0.3**	**0.1%**		
- Remote Sensing	$ 0.3	0.1%		
Unidentified	$ 15.6	6.7%	$ 12.9	16.9%

5. Research Activities and Tax Credit

Research activities

Under Act 261, 'Qualified Research Expense' is determined by the current year federal qualified research expenses incurred in Hawai'i regardless of the research expenses the QHTB made in the previous years. Reflecting the change, the average amount of credit claimed per QHTB for the years from the 2020 tax year was much larger than the average credit claimed for the 2013-2019 tax years. For the tax year 2022, the average credit claimed per QHTB was $0.46 million and the average per-QHTB credit claimed by the nine certified QHTBs was $0.69 million. In comparison, the average tax credit per QHTB reported in the DBEDT survey for the tax years 2013-2019 was $0.11 million. The average per-QHTB credit of $0.46 million for the 2022 tax year was also larger than $0.33 million for the 2020 tax year and $0.39 million for the 2021 tax year.

The twenty-six QHTBs spent a combined total of $59.4 million in research activities in Hawai'i in 2022, of which 20% ($11.9 million) was claimed for the tax credit. The portion of research expense funded from out-of-state sources was very small at 1.8% of total research expense. Of the twenty-six QHTBs, only three QHTBs reported that some of their research expense was funded from out-of-state sources; one QHTB with 100% of its research expense from out-of-state sources and two QHTBs with less than 10% from out-of-state sources. [1]

Table 13. Research expenses and tax credit claimed for the tax year 2022

Research expenses/credit claimed	All QHTBs (26)	Certified QHTBs (9)
Eligible research expense in Hawai'i, aggregate	$ 59.4 M	$ 31.0 M
---funded from out-of-state source (% of total eligible research expense)	$ 1.1 M (1.8%)	$ 0.1 M (0.3%)
Credit claimed, aggregate	$ 11.9 M	$ 6.2 M [1]
Credit claimed, per QHTB	$ 0.46 M	$ 0.69 M

[1] $ 6.2M were claimed by the nine certified QHTBs but $5M were certified due to $5M aggregate annual cap

[1] All the three QHTBs are Hawai'i based companies.

The amount of credit each individual QHTB claimed varied significantly by company, ranging from less than $5,000 to over $2 million. Among all QHTBs, five QHTBs (19.2%) claimed less than $50,000 and two of them were certified. On the other hand, there were five QHTBs (19.2%) that claimed over $1 million credit including one with over $2 million credit claimed. Three of the five QHTBs were certified, fully or partially, this year. The largest amount of credit certified for a QHTB this year was $1.5 million.

Table 14. QHTBs by the amount of credit claimed

Credit claimed	Among all QHTBs (26)		Among certified QHTBs (9) [1]	
	Number of QHTBs	% of total	Number of QHTBs	% of Total
Under $50K	5	19.2%	2	22.2%
$50K - $100K	4	15.4%	1	11.1%
$100K – $500K	8	30.8%	2	22.2%
$500K- $1M	4	15.4%	1	11.1%
$1M and over	5	19.2%	3	33.3%

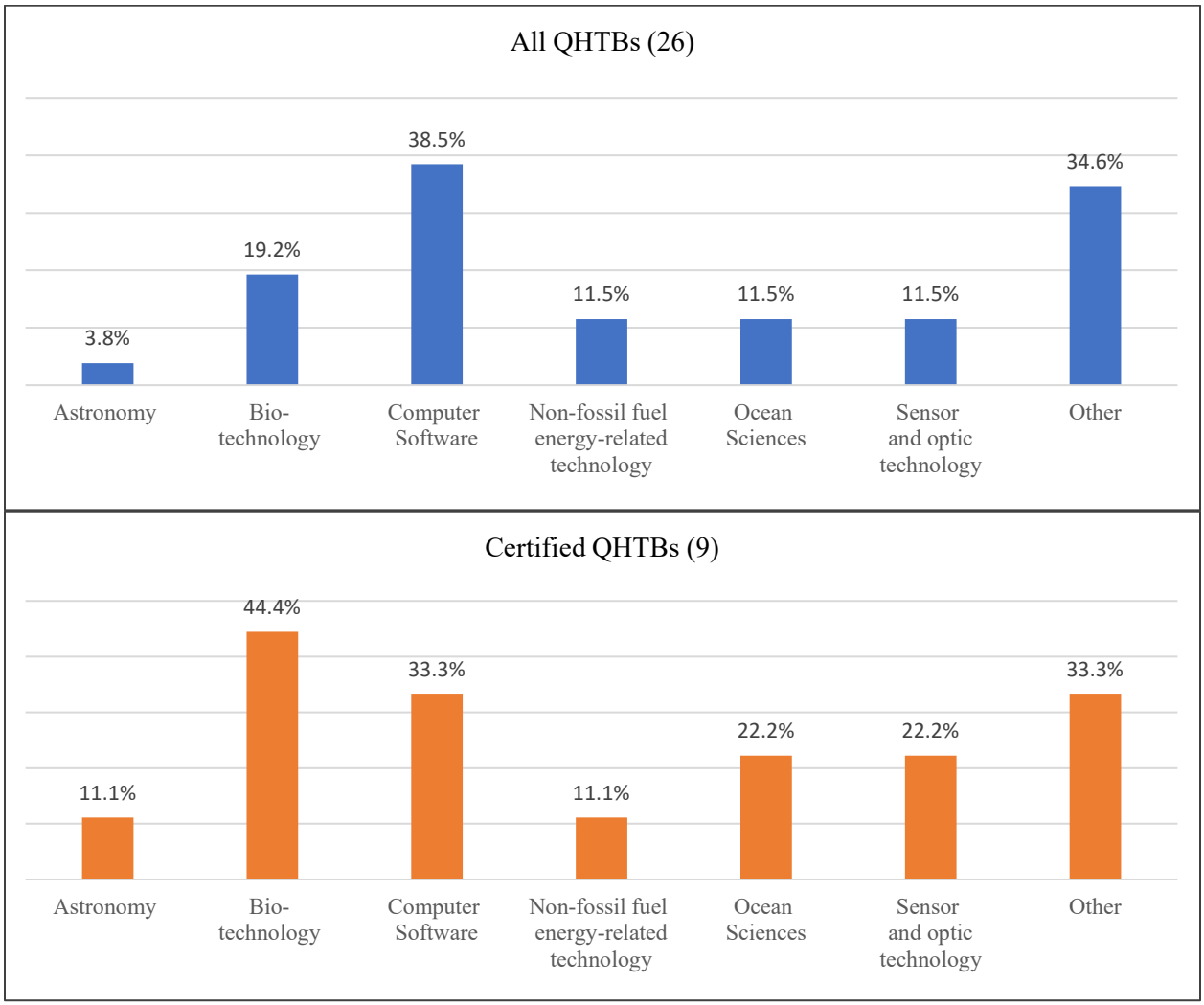
[1] Based on the amount claimed. There were two QHTBs whose credit was certified only partially.

Areas of research

Businesses were asked to indicate in which area(s) they conducted research during the year. Seven research areas, that were employed in defining 'Qualified research', were provided in the survey. Figure 4 presents the areas where the QHTBs conducted research in allowing multiple counts of a QHTB if it conducted research in multiple areas. Among all QHTBs that applied for the credit, 'Computer software' was the most common research area where ten out of twenty-six QHTBs conducted research. Nine QHTBs reported that they did research in areas outside these seven areas. The research areas that the companies reported under "Other" included Architectural Design/engineering (4), Agricultural Products (1), Aircraft emergency vision assurance systems (1), Ethernet Protocol (1), Online Webcam Streaming (1), and Scientific instrumentation for space flight (1).

As for the nine certified QHTBs, the highest concentration of their research was found in 'Biotechnology' (44.4%). Four out of the nine certified QHTBs conducted research in this area. The next common research area of the certified QHTBs was 'Computer software' (33.3%).

Figure 4. Areas where research was conducted in 2022

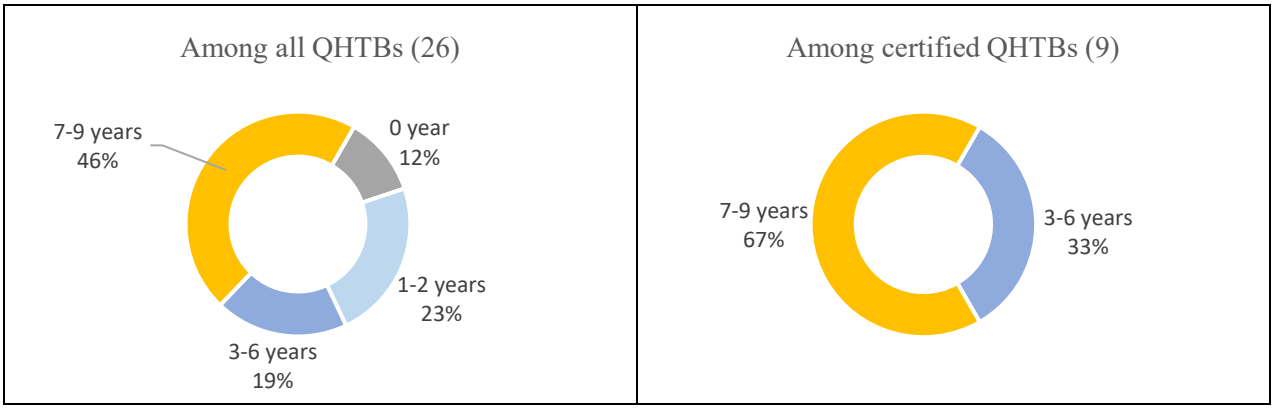


History of claiming the tax credit since 2013

The majority of the twenty-six QHTBs, and all the nine certified QHTBs, have been applying for the state research activity tax credit since before the new version of the credit started in 2020. Among those, twelve QHTBs have been applying for this credit almost every year since 2013 when the old version of the credit was introduced. On the other hand, there were three QHTBs who applied for the credit for the first time this year and six QHTBs who have applied before but only since the new version of the credit was introduced in 2020.[2] None of these companies were certified this year.

[2] History of claiming the credit was based on what the QHTB reported in the survey and DBEDT records from previous DBEDT surveys. If a QHTB didn't submit the DBEDT survey for the tax years 2013-2019 and didn't reveal its previous filing in the 2020-2022 survey, then it was not captured.

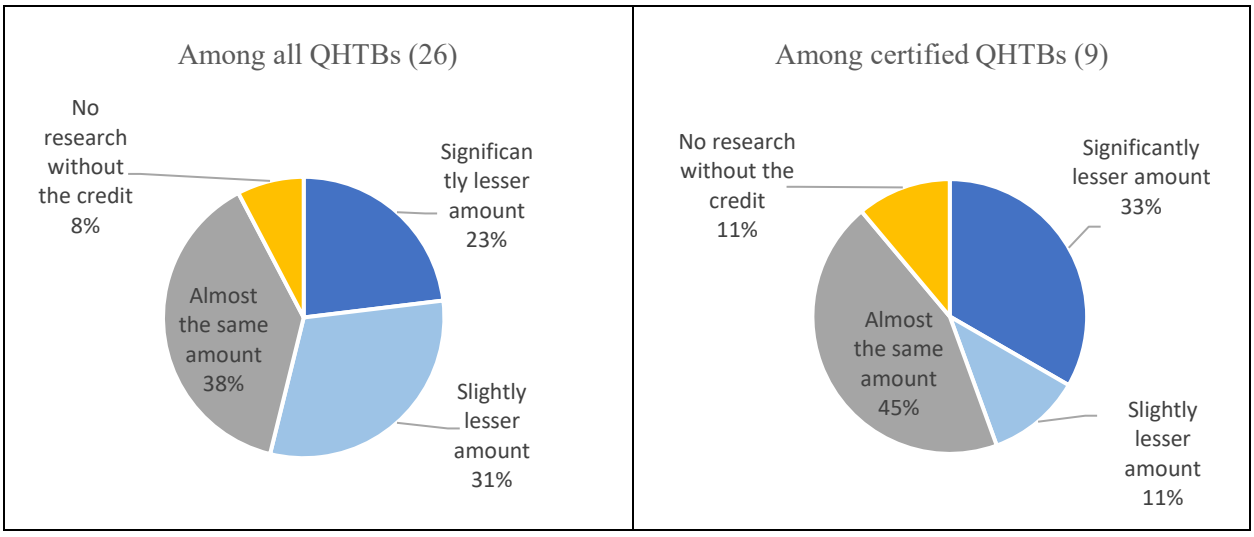
Figure 5. History of claiming the tax credit since 2013



Self-reported impact of the tax credit on research spending

It is not an easy task assessing the true impacts of the state research tax credit on a business's research decision because the QHTB may have an incentive to overstate the importance of the credit in determining its research spending. DBEDT survey asked the question anyway to get some insights on it. The QHTBs who answered that they would have made none or significantly lesser amount of research spending without the state credit was 31% of all QHTBs and 44% of the certified QHTBs. On the other hand, ten QHTBs (38% of all twenty-six QHTBs) answered that they would have made almost the same amount of research spending. That percentage was higher among the certified QHTBs at 45%. The reason why the significant number of QHTBs expressed "none or little impact of the tax credit on their decision of research spending" might be either that their decision on research spending was dominantly determined by factors other than the tax credit or that it takes time until the extension of the credit affects actual spending.

Figure 6. Self-reported impact of the tax credit on QHTB's research spending



6. Jobs and Wages

Employment overview

As of December 12, 2022, a total of 1,008 employees were working in a regular position at the twenty-six QHTBs. Most of them, 94.6%, were full-time employees. Since the condition to be a QHTB is to conduct more than 50% of its activities in qualified research, the proportion of research jobs was high at the QHTBs. About two in three regular employees were employed for research activities. Looking at the certified QHTBs only, the proportion of research jobs was higher at 82.8% of total regular jobs. The companies also hired a combined total of 90 workers on a temporary or seasonal basis during the calendar year 2022, almost all of them in research areas.

Table 15. Total employment by full-time/part-time status and by work area

Type of jobs	All QHTBs (26)			Certified QHTBs (9)		
	All areas	In research activities	Research jobs as % of total jobs	All areas	In research activities	Research jobs as % of total jobs
Total regular jobs	1,008	628	62.3%	511	423	82.8%
Full-time	954	599	62.8%	487	404	83.0%
Part-time	54	29	53.7%	24	19	79.2%
Temporary/seasonal	90	89	98.9%	86	85	98.8%

Employment size

The size of companies, measured in the number of employees, varied substantially by QHTB. The number of regular employees in each QHTB ranged as small as zero to as big as over 170. Over 40% of the QHTBs were small sized with ten or less employees, of which four QHTBs were particularly small with none or one employee. On the other hand, five QHTBs (19.2% of all QHTBs) had more than one hundred employees as of December 2022.

Table 16. QHTBs by the size of employment

Number of regular employees [1] (as of December 12, 2022)	Among all QHTBs (26)		Among certified QHTBs (9)	
	Number of QHTBs	% of total	Number of QHTBs	% of Total
0-1	4	15.4%	2	22.2%
2-10	7	26.9%	1	11.1%
11-50	8	30.8%	2	22.2%
51-100	2	7.7%	1	11.1%
Over 100	5	19.2%	3	33.3%

[1] Includes both full-time and part-time employees but excludes temporary and seasonal employees

Job changes in QHTBs from the prior year

As in the previous years, there was no clear sign of positive impacts of the research tax credit on job creation in high-tech companies. In aggregate, the number of jobs at the twenty-six QHTBs in 2022 showed a small decrease from the prior year. At the individual company level, however, the job performance was mixed. While nine QHTBs experienced a job decrease, there were nine QHTBs with no change in jobs and six QHTBs who experienced an increase in jobs.

Reflecting the economic disruption caused by the 2020 pandemic and the recoveries afterwards, total Hawai‘i non-farm wage and salary jobs in December 2020 decreased by 16.2% from the same month 2019 then saw a 9.5% and 3.5% increase from the same month prior year in December 2021 and 2022. However, no significant impact of the pandemic was observed in these research-oriented high-technology companies in Hawai‘i. The twenty-six QHTBs that claimed the credit this year showed a somewhat opposite performance: 3.5% increase, 3.3% decrease, and 1.0% decrease from the same month prior year in their aggregate jobs in 2020, 2021, and 2022 respectively.

Table 17. Changes in total employment from 2021 to 2022, as of December 12

Type of Employment		Aggregate of all 26 QHTBs	Aggregate of 9 certified QHTBs
Full-time	In all areas	16	6
	In research activities	12	-11
Part-time	In all areas	-26	-8
	In research activities	-2	-6
Full-time &Part-time	In all areas	-10	-2
	In research activities	10	-17

Table 18. QHTBs by the status of job change from the prior year

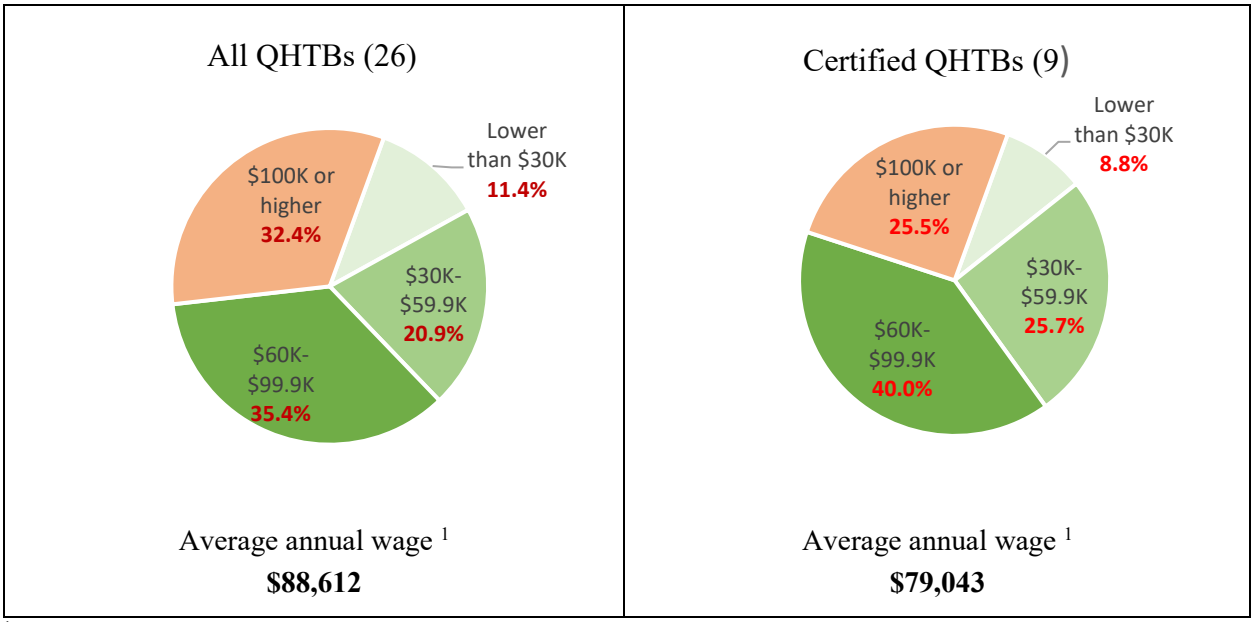
Change in regular jobs from 2021 to 2022		Among all QHTBs [1]		Among certified QHTBs (9)	
		Number of QHTBs	% of total	Number of QHTBs	% of total
In all jobs	Increase	6	25.0%	2	22.2%
	No change	9	37.5%	3	33.3%
	Decrease	9	37.5%	4	44.4%
In research jobs	Increase	8	33.3%	2	22.2%
	No change	11	45.8%	4	44.3%
	Decrease	5	20.8%	3	33.3%

[1] excluding two QHTBs who didn't report their number of employees

Wages

Figure 7 presents the wage distribution of full-time employees at the QHTBs. About a third of full-time employees at the twenty-six QHTBs were paid at least $100,000 annually with the average annual wage, weighted by the number of full-time employees at each QHTB, at $88,612. The wage distribution of full-time employees at the nine certified QHTBs was quite similar but the average annual wage was a little lower at $79,043.

Figure 7. Annual wage of full-time employees at QHTBs



[1] Weighted by the number of full-time employees at the QHTB

To portray various compensation levels at these research-oriented companies in Hawai‘i, Table 19 presents the distribution of QHTBs by the average annual wage of full-time employees at the QHTB. Of twenty-three QHTBs that had at least one full time employee as of December 2022 and reported its average annual wage in the survey, seven QHTBs had an average annual wage of $100,000 or higher while six QHTBs reported an average annual wage under $75,000.

Table 19. QHTBs by the average annual wage of full-time employees at the QHTB

Average wage of full-time employees at the QHTB	Among all QHTBs (26)		Among certified QHTBs (9)	
	Number of QHTBs	% of total	Number of QHTBs	% of total
Under 50K	0	0.0%	0	0.0%
$50K - $74.9K	6	23.1%	3	33.3%
$75K - $99.9K	10	38.5%	3	33.3%
$100K - $149.9K	4	15.4%	3	33.3%
$150K – 199.9K	2	7.7%	0	0.0%
$200K and higher	1	3.8%	0	0.0%
No full-time employee or average wage not reported [1]	3	11.5%	0	0.0%

[1] There were two QHTBs with no full-time employee. Among twenty-four QHTBs with at least one full-time employee, one QHTBs didn’t report their average wage.

7. Impacts of QHTBs’ Activities on External Companies

Table 20 summarizes the impact of business activities of the QHTBs on other companies in Hawai‘i. Among the twenty-six QHTBs, seventeen QHTBs (65%) reported that they hired independent contractors or procured external services in 2022. They spent a combined total of $16.5 million to hire or procure a total of 358 contractors or external services for jobs performed in Hawai‘i. About half of the spending, 53.9%, was made in ‘Scientific and Technical Contract Services’ area.

To assess spill-over effects of QHTBs’ research activities on other companies in Hawai‘i the survey also asked if there was any new company established to commercialize the intellectual

property owned by the QHTBs. The survey results indicated that there was no new company established in 2022.

Table 20. Impacts of QHTBs' activities on external companies in Hawai‘i in 2022

	All QHTBS (26)	Certified QHTBs (9)
Independent contractor expenses incurred by the QHTBs	$16.5M	$5.0M
Total number of independent contractors hired/external services procured by the QHTBs	358	128
Number of new companies established in Hawai‘i to commercialize the QHTBs' intellectual property	0	0

Appendix

Table A- 1. List of QHTBs that applied for Hawai‘i research tax credit for the tax year 2022

Company name	Business Location	Certified
Architects Hawai‘i & Limited & Subsidiaries	Honolulu, Hawai‘i	Yes
HNU Photonics LLC	Kahului, Hawai‘i	Yes (partial)
Hawai‘i Biotech Inc	Honolulu, Hawai‘i	Yes
HiPoint Software, LLC	Honolulu, Hawai‘i	Yes
Kuehnle AgroSystems Inc.	Honolulu, Hawai‘i	Yes
Oceanit Laboratories, Inc.	Honolulu, Hawai‘i	Yes
Ozolio Inc	Kahului, Hawai‘i	Yes
PacMar Technologies LLC	Honolulu, Hawai‘i	Yes
Pioneer Hi-Bred International, Inc.	Wilmington, Delaware	Yes (partial)
Alpha, Inc.	Kahului, Hawai‘i	No
Big Island Pain Center	Hilo, Hawai‘i	No
BWA Design, LLC	Honolulu, Hawai‘i	No
Hawai‘i Aerospace Corporation	Honolulu, Hawai‘i	No
Innov8 Solutions, LLC.	Honolulu, Hawai‘i	No
Kamakura Corporation	Honolulu, Hawai‘i	No
LiveAction Holdings, Inc.	Palo Alto, California	No
Lowney, Inc.	Oakland, California	No
Makai Ocean Engineering, INC.	Honolulu, Hawai‘i	No
MLS Hawai‘i, Inc. dba Hawai‘i Information Service	Honolulu, Hawai‘i	No
Nalu Scientific, LLC	Honolulu, Hawai‘i	No
Research Corporation	Honolulu, Hawai‘i	No
Simonpietri Enterprises LLC	Honolulu, Hawai‘i	No
Spirent Communications Hawai‘i LLC	Honolulu, Hawai‘i	No
Syngenta Seeds LLC and Affiliates	Wilmington, Delaware	No
VisionSafe Corporation	Honolulu, Hawai‘i	No
VMware, Inc.	Broomfield, Colorado	No

Table A- 2. Business area of QHTBs in 2022 by detailed category
(A QHTB is counted multiple times if it conducted business in multiple areas)

Industry sector	Subsector	Number of QHTBs	
		Among all QHTBs (26)	Among certified QHTBs (9)
Agricultural Biotechnology	Aquaculture	1	1
	Plant Tissue Culture/Seed Propagation/Seed Corn	3	2
	Other	1	1
Astronomy	Adaptive Optics	2	2
	Modeling & Simulation	2	2
	Photonics	3	2
	Precision Mechanics	2	2
	Remote Sensing	2	2
Biotechnology/ Life Sciences	Biocomputing	1	1
	Bioinformatics/ Biophotonics	2	2
	Biologics/ Vaccines	2	2
	Contract Research Organization	1	1
	Diagnostics/Therapeutics	1	1
	Genomics/Proteomics	1	1
	Healthcare Facility	1	0
	Medical Devices	3	2
	Other	1	1
Defense/ Aerospace	Antenna Systems & Management	1	1
	Communications & Computer Systems	1	1
	Information Services	1	1
	Modeling/Simulation/Training	2	2
	Optics	2	2
	Photonics	3	2
	Remote Sensing	3	2
	Specialty Software Development	2	2
	Testing & Evaluation	2	2
	Other	3	1

Table A- 2. Business area of QHTBs in 2022 by detailed category -- continued
(A QHTB is counted multiple times if it conducted business in multiple areas)

Industry sector	Subsector	Number of QHTBs	
		Among all QHTBs (26)	Among certified QHTBs (9)
Energy	Distributed Generation	1	1
	Energy Efficiency	3	2
	Fuel Cells	2	1
	Geothermal	2	1
	Ocean	1	1
	Renewable Fuels	3	1
	Solar	3	2
	Waste-to-Energy	2	1
	Other	1	1
Environmental	Air Technologies	1	1
	Disaster Mitigation Management	1	1
	Soil Technologies	2	1
	Water Technologies	2	1
	Other	1	0
Information/Communication Technology	Antenna Systems & Management	1	1
	Information Services	4	1
	Laser	1	1
	Modelling/Simulation/Trainings	1	1
	Optics	1	1
	Photonics	2	1
	Remote Sensing	2	1
	Specialty Software Development	9	3
	Telecommunications/Networks	1	0
	Testing & Evaluation	2	1
	Wireless	1	1
	Other	1	0
Ocean Sciences	Acoustics	1	1
	Marine Biotechnology	1	1
	Ocean Engineering	3	2
	Oceanography	1	1
	Remote Sensing	2	1
	Unmanned Vehicles	1	1
Other sectors	Architecture/Civil Engineering Design	4	1