

---

**Report on**  
**Hawaii Tax Credit for Research Activities**  
**for Tax Year 2021**

---

**August 2022**

**Department of Business, Economic Development and Tourism**

**State of Hawaii**





This report fulfills the reporting requirements of Act 261, Hawaii Revised Statutes, 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.

## Table of Contents

Executive Summary	1
1. Introduction	5
2. Summary of Tax Credit Certification	6
3. Characteristics of QHTBs	8
- Business location	8
- History of doing business and research	8
- Intellectual properties	9
- Business areas	10
4. Revenue and Spending Structure	12
- Revenue structure	12
- Hawaii expenses of QHTBs	14
5. Research Activities and Tax Credit	16
- Research activities	16
- Areas of research	17
- History of claiming the tax credit since 2013	18
- Self-reported impact of the tax credit on research spending	19
6. Jobs and Wages	20
- Employment overview	20
- Employment size	20
- Job changes in QHTBs from the prior year	21
- Wages	22
7. Impacts of QHTB’s Activities on External Companies	23
Appendix	25

## **List of Tables**

Table S1. Summary statistics on the characteristics and activities of QHTBs	4
Table 1. Application and certification of Hawaii Research Tax Credit, tax year 2021	7
Table 2. QHTBs by the year established	8
Table 3. History of research activities	9
Table 4. Aggregate number of patents owned or pending as of 12/31/2021	9
Table 5. QHTBs by the number of patents owned or pending as of 12/31/2021	10
Table 6. Business areas of QHTBs in 2021	10
Table 7. Aggregate amount of revenue and expenses	12
Table 8. QHTBs by the size of revenue	12
Table 9. Aggregate amount of revenue by source	13
Table 10. QHTBs by its dependence of revenue on out-of-state sales	14
Table 11. QHTBs by its dependence of revenue on intellectual property-based sales	14
Table 12. Areas where QHTBs spent their operating and capital expense in 2021	15
Table 13. Research expenses and tax credit claimed for the tax year 2021	16
Table 14. QHTBs by the amount of credit claimed	17
Table 15. Total employment by full-time/part-time status and by work area	20
Table 16. QHTBs by the size of employment	21
Table 17. Changes in total employment from 2020 to 2021	21
Table 18. QHTBs by the status of job change from the prior year	22
Table 19. QHTBs by the average annual wage of full-time employees at the QHTB	23
Table 20. Impacts of QHTBs' activities on external companies in Hawaii in 2021	24
Table A-1. List of QHTBs that applied for Hawaii research tax credit for tax year 2021	26
Table A-2. Business areas of QHTBs in 2021 by detailed category	27

## List of Figures

Figure 1. Share of the certified QHTBs among all applicants	7
Figure 2. QHTBs with Hawaii business address	8
Figure 3. Number of QHTBs that conducted business in each sector	11
Figure 4. Areas where research was conducted in 2021	18
Figure 5. History of claiming the tax credit since 2013	19
Figure 6. Self-reported impact of the tax credit on QHTB's research spending	19
Figure 7. Annual wage of full-time employees at QHTBs	22

## Executive Summary

- This report fulfills the reporting requirements of Act 261, Hawaii Revised Statutes, 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 Hawaii tax credit for research activities for the tax year 2021. 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 thirty-five QHTBs applied for the Hawaii tax credit for research activities for the tax year 2021 by submitting an executed Form N-346A. Among them, thirty-four QHTBs completed the application by submitting the required DBEDT survey.
- The thirty-four QHTBs spent a combined total of \$66.8 million in research activities in Hawaii in 2021, of which 20% (\$13.3 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. The ninth QHTB was certified for a partial amount of the credit it claimed because of the \$5 million aggregate annual cap.
- Reflecting the changes made in the new law, the average amount of credit claimed per QHTB since the tax year 2020 (under the new law) was much bigger than in the 2013-2019 tax years. For the tax year 2021, the average credit claimed per QHTB was \$0.39 million, and the average per-QHTB credit claimed by the nine certified QHTBs was \$0.67 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 amount of credit claimed by individual QHTBs varied significantly, ranging from less than \$500 to over \$2 million. Among the thirty-four QHTBs, eleven QHTBs (32.4%) claimed less than \$50,000 for the credit. On the other hand, six QHTBs claimed over \$1 million credit including one of which claimed over \$2.5 million tax credit. The highest amount of the credit certified for a QHTB this year was \$1.8 million.
- Although the size of the company was not used as a factor for certification, the certified QHTBs tended to be larger than the average of all applicants. The proportion of the nine certified QHTBs in total tax credit claimed and total employees hired was 45% and 39% respectively, larger than their proportion (26%) to the total number of applicants.

- There were seven QHTBs (two of which were certified) that provided a business address outside Hawaii. Each of the other twenty-seven QHTBs had a business address in Hawaii, which means that they either headquartered in Hawaii or at least had an office in Hawaii.
- Many QHTBs that applied for this year's tax credit had a long history of doing business as three in four QHTBs were established before 2010. Regarding research activities, the majority of the QHTBs have been doing the research for the entire history of their business (71% of all QHTBs and 89% of the certified QHTBs).
- There was a mainland-based company that reported over 4,000 patents owned by the company as of 12/31/2021. Excluding the exceptional company, a total of 210 patents were owned or pending as of 12/31/2021 by the thirty-three QHTBs, which is 6.4 patents per QHTB on average. About 90% of them originated in Hawaii. However, owning at least a patent was not something that was shared by all companies. About 60% of the QHTBs didn't own a single patent.
- 'Information and Communication Technology' sector was the most popular business sector among the QHTBs with thirteen QHTBs doing business in the sector. This sector was the most popular business sector among the certified QHTBs as well. Looking at the distribution of business areas of the certified QHTBs, this year's certifications were issued to the companies in more diverse areas.
- In aggregate, the thirty-four QHTBs generated a total of \$223 million revenue from all goods and services produced in Hawaii, spent a little less amount, \$195 million, as operating cost, and paid a total of \$80 million as payroll. That was \$6.5 million revenue, \$5.7 million operating cost, and \$2.3 million payroll expense per QHTB on average.
- Overall dependence of the QHTBs on out-of-state sales was relatively high. More than a third of the combined revenue of the thirty-four 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.
- The QHTBs were either highly dependent on out-of-state sales or not dependent at all, with not many QHTBs in the middle. About half of the QHTBs (47% of all QHTBs and 56% of the certified QHTBs) sold all their Hawaii produced goods and services locally with no out-of-state sales. On the other hand, 29% of all QHTBs and 11% of the nine certified QHTBs sold more than 80% of their Hawaii produced goods and services to out-of-state markets.

- Among the thirty-two revenue-generating QHTBs in the tax year 2021, thirteen QHTBs made more than 80% of their revenue from intellectual property produced in Hawaii while sixteen QHTBs had no revenue from intellectual property-based sales. In aggregate, the proportion of intellectual property-based revenue was about a quarter of their total revenue.
- As of December 12, 2021, a total of 1,028 employees were working in a regular position at the thirty-four QHTBs. Most of them, 89.5%, 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 among the QHTBs. More than two third of their regular employees were employed for research activities.
- Over a third of full-time employees at the thirty-four QHTBs were paid at least \$100,000 annually with overall average annual wage of \$93,634. While the average wage level of the QHTBs was higher than that in many other sectors in Hawaii, the compensation level at high tech companies in Hawaii was diverse. Of thirty-one QHTBs that had at least one full time employee and reported its average annual wage in the survey, fourteen QHTBs had an average annual wage of \$100,000 or higher while eight QHTBs reported an average annual wage under \$75,000.
- In aggregate, the number of jobs at the thirty-four QHTBs in 2021 showed a small decrease from the prior year. At the individual company level, however, the job performance was almost evenly mixed among “increase”, “no change”, and “decrease” from the prior year, showing no clear sign of positive impacts of the research tax credit on job creation in high-tech companies.
- Among the thirty-four QHTBs, twenty-one QHTBs (61.8%) have hired independent contractors or procured external services in 2021, spending a combined total of \$23.9 million to hire or procure a total of 419 contractors or external services for jobs performed in Hawaii. The bulk of this spending, 70.7%, was made in ‘Scientific and Technical Contract Services’.
- To assess spill-over effects of QHTBs’ research activities on other companies in Hawaii 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 2021.



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

	All QHTBs	Certified QHTBs
<b>Number of QHTBs</b>	34	9 <sup>1</sup>
% of QHTBs with a Hawaii business address	79%	78%
<b>Research</b>		
Research expense incurred in Hawaii (aggregate)	\$66.8M	\$30.0M
per QHTB	\$2.0M	\$3.3M
% funded from out-of-state sources	2.2%	3.5%
Tax credit claimed (aggregate)	\$13.3M	\$6.0M <sup>2</sup>
per QHTB	\$0.39M	\$0.67M
-QHTBs with credit “Under \$100K”	(44.2%)	(44.4%)
-QHTBs with credit “\$100K-\$500K”	(35.3%)	(22.2%)
-QHTBs with credit “\$500K-\$1M”	(2.9%)	(0.0%)
-QHTBs with credit “\$1M or over”	(17.6%)	(33.3%)
Tax credit certified (aggregate)	\$5M	\$5M
Top research area	Computer software	Computer software
<b>Patents</b> (owned or filed)		
-QHTBs with “0” patent	(58.8%)	(55.6%)
-QHTBs with “1-10” patents	(23.5%)	(22.2%)
-QHTBs with “over 10” patents	(17.6%)	(22.2%)
<b>Revenue/Expense</b>		
Revenue (aggregate)	\$222.8.7M	\$58.4M
per QHTB	\$6.6M	\$6.5M
% of revenue from out of state sales	39.0%	4.5%
% of revenue from intellectual properties	26.2%	14.5%
Operation expenses (aggregate)	\$195.0M	\$65.0M
Capital expenditure (aggregate)	\$2.5M	\$0.7M
<b>Employment</b> <sup>3</sup>		
Number of employees (aggregate)	1,028	399
per QHTB	30.2	44.3
Research jobs as % of total jobs	69.1%	88.8%
<b>Job changes from 2020</b>		
-QHTBS with job “Increase”	(38.2%)	(44.4%)
-QHTBS with job “No change”	(29.4%)	(33.3%)
-QHTBS with job “Decrease”	(32.4%)	(22.2%)
<b>Avg. annual wage of full-time employee</b>		
Weighted average of QHTBs <sup>4</sup>	\$93,634	\$88,128
-QHTBs with avg. wage “Under \$75K”	(23.5%)	(22.2%)
-QHTBs with avg. wage “\$75K- \$99.9K”	(26.5%)	(33.3%)
-QHTBs with avg. wage “\$100K- \$149.9K”	(29.4%)	(44.4%)
-QHTBs with avg. wage “\$150K or over”	(11.8%)	(0.0%)

1. Including a QHTB of which claimed credit was partially certified

2. \$6.0M 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.

Hawaii'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 Hawaii and was non-refundable.

Benefits of the Hawaii research tax credit increased substantially in 2000, when Act 297 raised the Hawaii 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. Hawaii 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 Hawaii 2013, re-established Hawaii'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 Hawaii 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 Hawaii Department of Taxation. Total amount of credits claimed with the Hawaii 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 Hawaii 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 Hawaii in that tax year. However, it requires all claims to be certified by DBEDT before it is claimed with the Hawaii 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 second 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 Hawaii tax credit for research activities for the tax year 2021. 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 Hawaii 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 Hawaii tax credit for research activities for the tax year 2021.

A total of thirty-five QHTBs applied for the Hawaii research activity tax credit for the tax year 2021 by submitting an executed Form N-346A by March 31<sup>st</sup>, 2022. Among those, thirty-four 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. The first eight QHTBs were certified for the full amount they claimed while the ninth QHTB was certified for a partial amount of the credit it claimed, due to the \$5 million aggregate annual cap. Throughout this report, ‘all QHTBs’ or ‘all applicants’ refers to the thirty-four QHTBs that completed the application by submitting the DBEDT survey, and the

‘certified QHTB’ refers to the nine QHTBs including the ninth QHTB of which claimed credit was partially certified.

Table 1. Application and certification of Hawaii Research Tax Credit, tax year 2021

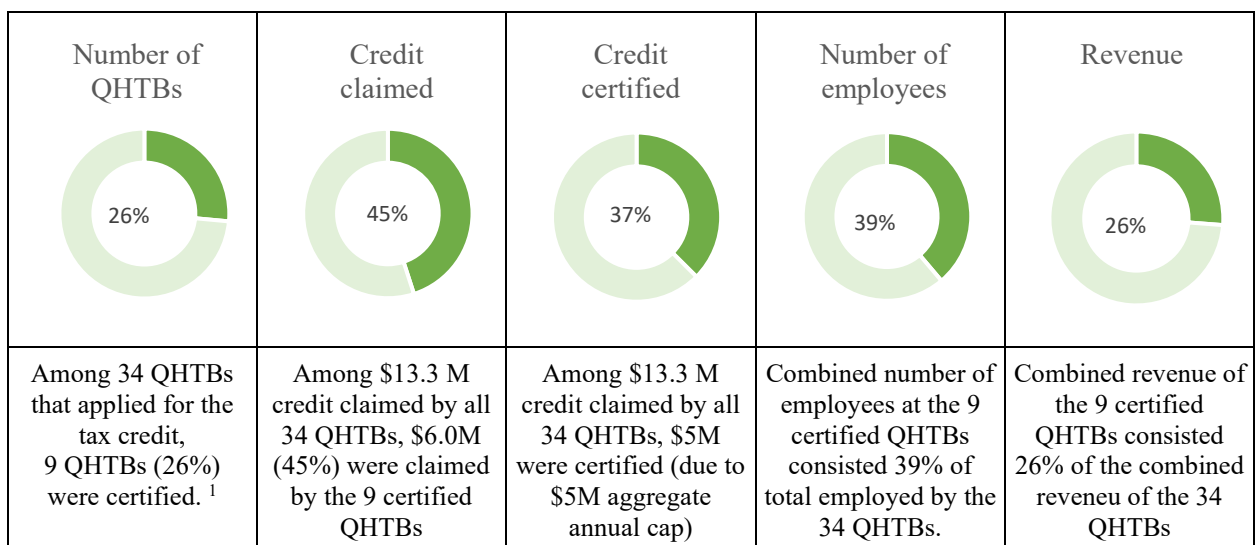
(Number of QHTBs)

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
35	34	9	8	1

Although the size of the company was not employed as a factor for certification, the certified QHTBs tended to be larger than the average of all applicants. Figure 1 shows the share of the nine certified QHTBs among all thirty-four 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 45% and 39% respectively, larger than their proportion (26%) to the total number of applicants. The certified QHTBs also tended to be larger in revenue, but the average size of the revenue of the nine certified QHTBs was not larger than the overall average because of a certified company that showed an unusual business pattern. The company reported over 150 employees and over \$10 million research expense but zero revenue in the 2021 tax year.

Figure 1. Share of the certified QHTBs among all applicants



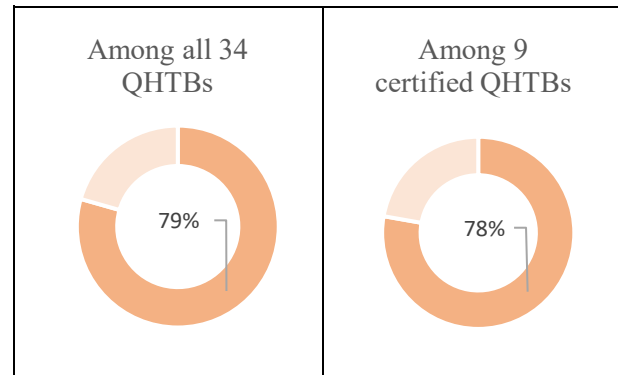
1. The ninth QHTB was certified for a partial amount of the credit it claimed due to the annual cap of \$5 million to be certified

### 3. Characteristics of QHTBs

#### Business location

There were seven QHTBs (two of them were certified) that provided a business address outside Hawaii. Each of the other twenty-seven QHTBs had a business address in Hawaii, which means that they either headquartered in Hawaii or at least had an office in Hawaii. Out-of-state address included California (2), Delaware (2), Arizona (1), Massachusetts (1), and Washington (1)

Figure2. QHTBs with Hawaii 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 three in four QHTBs were established before 2010. Compared to the previous year, this year’s certification included more newer companies. Among the nine certified QHTBs, three companies have been doing business for ten or less years.

Table 2. QHTBs by the year established

QHTBs	Year when it was established					
	all	~ 1990	1991-2000	2001-2010	2011-2015	2016 and after
All QHTBs (34)	100%	26.5%	17.6%	29.4%	17.6%	8.8%
Certified QHTBs (9)	100%	22.2%	33.3%	11.1%	22.2%	11.1%

Regarding research activities, the majority of the QHTBs have been doing the research for the entire history of their business (71% of all QHTBs and 89% of the certified QHTBs). Only six of the thirty-four QHTBs reported the research history much shorter than the business history of the QHTB.

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 (34)	100%	20.6%	17.6%	26.5%	35.3%
Certified QHTBs (9)	100%	22.2%	22.2%	0.0%	55.6%

Intellectual properties

A total of 4,647 patents were reported to be owned or pending as of 12/31/2021 by all thirty-four QHTBs that applied for the tax credit this year. However, a caution is required here as 95% of them were reported by a single company. That company was one of the seven mainland-based companies and was certified for the tax credit this year. Excluding the exceptional company, a total of 210 patents were owned or pending as of 12/31/2021 by thirty-three QHTBs, which is 6.4 patents per QHTB on average. About 90% of them originated in Hawaii. 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 12/31/2021

QHTBs	Patents as of 12/31/2021			Number of patents (owned or pending) originating in Hawaii <sup>1</sup>
	Owned or pending	Owned	Pending	
All QHTBS (34)	4,647	4,584	63	218
Certified QHTBs (9)	4,511	4,476	35	105
Excluding the outlier that explains 95% of total number reported above				
All QHTBS (34) - 1	210	147	63	186
Certified QHTBs (9) - 1	74	39	35	73

<sup>1</sup> Patent origin is determined by the residence of the first-named inventor

Owning at least a 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. Almost 60% of the QHTBs didn't own even a single patent while only about 20% of all thirty-four QHTBs and nine certified QHTBs owned more than 10 patents.

Table 5. QHTBs by the number of patents owned or pending as of 12/31/2021

Patents owned or pending	Among all QHTBs (34)		Among certified QHTBs (9)	
	Number of QHTBs	% of total	Number of QHTBs	% of total
0 (no patent)	20	58.8%	5	55.6%
1-10 patents	8	23.5%	2	22.2%
11-50 patents	3	8.8%	0	0.0%
51-100 patents	2	5.9%	1	11.1%
Over 100 patents	1	2.9%	1	11.1%

Business areas

The survey asked each QHTB to indicate all industry sectors where the QHTB conducted business in 2021. Eight major business sectors consisting of eighty-four subsectors were provided in the survey as business categories. By broad category, about three quarters of the QHTBs indicated that they conducted business only in one business sector while about a quarter of the QHTBs indicated that they did business in multiple sectors.

Table 6. Business areas of QHTBs in 2021

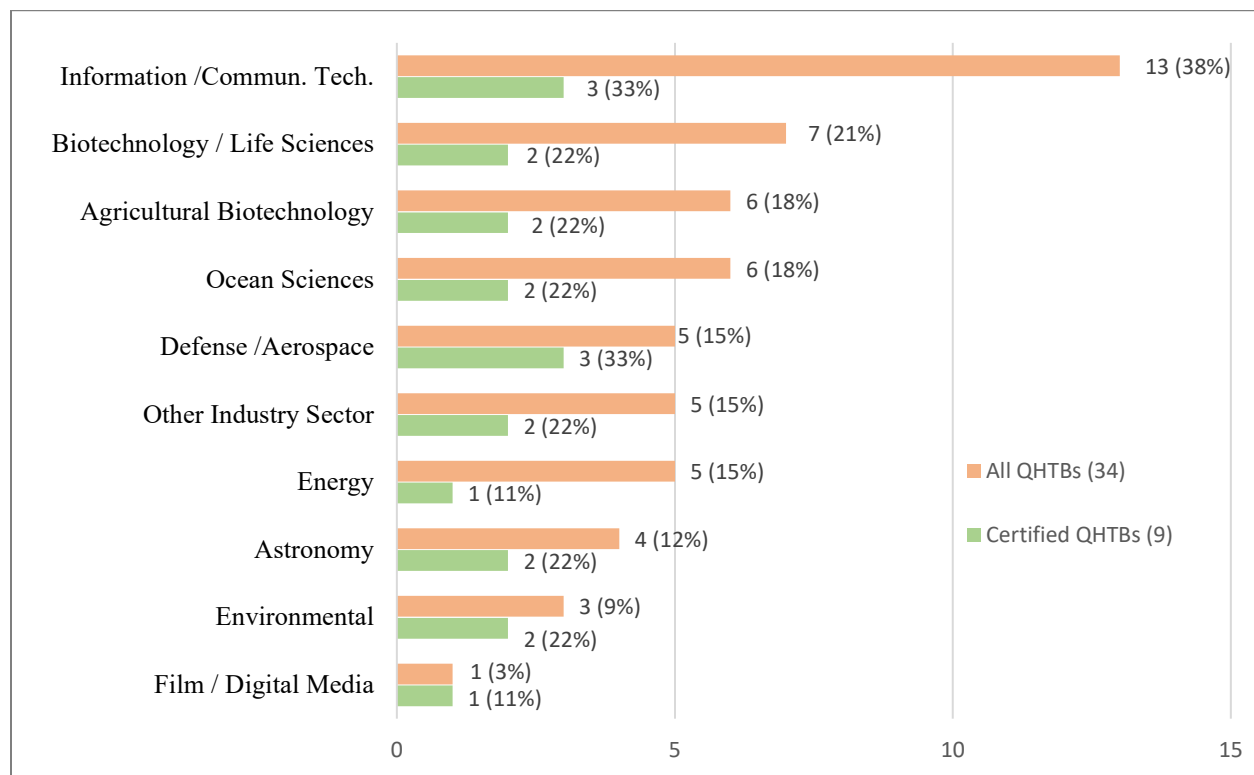
Business sectors		Number of QHTBs	
		Among all QHTBs (34)	Among certified QHTBs (9)
One sector only	Agricultural Biotechnology	3	1
	Astronomy	1	0
	Biotechnology/Life Sciences	2	0
	Defense/ Aerospace	2	1
	Energy	2	0
	Film/Digital Media	1	1
	Information/ Communication Technology	8	1
	Ocean Sciences	3	1
	Other (Architecture)	3	1
	Other one sector	1	0
Doing business in more than one sector		8	3

Figure 3 shows total numbers of QHTBs that conducted business in each industry sector in 2021, counting the multi-sector companies 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 thirteen QHTBs doing business in the sector. This sector was the most popular business sector among the certified QHTBs as well. Looking at the distribution of business areas of the certified QHTBs, this year’s certifications were issued to the companies in more diverse business areas.

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 eight QHTBs doing business in this sub-sector in 2021. The next popular sub-sectors included ‘Information Services’ in the same sector (six QHTBs), and ‘Plant Tissue Culture’ and ‘Seed Propagation/ Seed Corn’ in the ‘Agricultural Biotechnology’ sector (five QHTBs in each sub-sector).

Figure 3. Number of QHTBs that conducted business in each sector (with multiple counting)<sup>1</sup>



<sup>1</sup> 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 2021. The thirty-four QHTBs generated a total of \$223 million revenue from all goods and services produced in Hawaii, spent a little less amount, \$195 million, as operating cost for goods and services produced in Hawaii, and paid a total of \$80 million as payroll. That was \$6.5 million revenue, \$5.7 million operating cost, and \$2.3 million payroll expense per QHTB on average. However, the survey showed a wide spectrum of businesses including companies with less than ten thousand dollars of annual revenue to companies with over thirty million dollars of annual revenue.

Table 7. Aggregate amount of revenue and expenses

Annual revenue/expenses	All QHTBs (34)	Certified QHTBs (9)
Revenue <sup>1</sup>	\$222.8M	\$58.4M
Operating cost <sup>1</sup>	\$195.0M	\$65.0M
Capital expenditures <sup>1</sup>	\$2.5M	\$0.7M
Payroll expense <sup>2</sup>	\$79.5M	\$37.6M

<sup>1</sup> Earned from or incurred for all goods and services produced in Hawaii

<sup>2</sup> For employees requiring Hawaii W-2 form, including fringe benefits, health insurance, and employment taxes

Table 8. QHTBs by the size of revenue

Annual revenue <sup>1</sup>	Among all QHTBs (34)		Among certified QHTBs (9)	
	Number of QHTBs	% of total	Number of QHTBs	% of total
Under \$100K <sup>2</sup>	5	14.7%	2	22.2%
\$100K - \$1M	8	23.5%	2	22.2%
\$1M - \$5M	9	26.5%	2	22.2%
\$5M - \$10M	4	11.8%	1	11.1%
Over \$10M	8	23.5%	2	22.2%

<sup>1</sup> Earned from or incurred for all goods and services produced in Hawaii

<sup>2</sup> Includes 2 QHTBs with zero revenue (1 among the certified)

Overall dependence of the QHTBs on out-of-state sales was relatively high. More than a third of the combined revenue of the thirty-four 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.

On the other hand, on average, the QHTBs earned about a quarter of their revenue from intellectual property produced in Hawaii. Dependence of their revenue on intellectual property-based sales was lower among the certified QHTBs (14.5% vs. 26.2%).

Table 9. Aggregate amount of revenue by source

Revenue (aggregate)	All QHTBs (34)		Certified QHTBs (9)	
	\$ million	% of total revenue	\$ million	% of total revenue
Total annual revenue	\$222.8	100%	\$58.4	100%
By source of revenue				
- from out-of-state sales	\$87.0	39.0%	\$2.6	4.5%
- from intellectual property <sup>1</sup>	\$58.5	26.2%	\$8.5	14.5%
- from intellectual-property-based out-of-state sales <sup>1</sup>	\$44.9	20.1%	\$2.6	4.5%

<sup>1</sup> Intellectual property produced in Hawaii

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. About half of the QHTBs (47% of all QHTBs and 56% of the certified QHTBs) sold all their Hawaii produced goods and services locally with no out-of-state sales. On the other hand, 29% of all QHTBs and 11% of the certified QHTBs sold more than 80% of Hawaii 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 thirty-two revenue-generating QHTBs in the tax year 2021, thirteen QHTBs made more than 80% of their revenue from the intellectual property produced in Hawaii while sixteen 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 (34)		Among certified QHTBs (9)	
	Number of QHTBs	% of total	Number of QHTBs	% of total
0%	16	47.1%	5	55.6%
1-20%	4	11.8%	2	22.2%
21-50%	1	2.9%	0	0.0%
51-80%	1	2.9%	0	0.0%
Over 80%	10	29.4%	1	11.1%
NA (no revenue)	2	5.9%	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 <sup>1</sup>	Among all QHTBs (34)		Among certified QHTBs (9)	
	Number of QHTBs	% of Total	Number of QHTBs	% of total
0%	16	47.1%	4	44.4%
1-20%	2	5.9%	1	11.1%
21-50%	0	0.0%	0	0.0%
51-80%	1	2.9%	0	0.0%
Over 80%	13	38.2%	3	33.3%
NA (no revenue)	2	5.9%	1	11.1%

<sup>1</sup> Intellectual property produced in Hawaii

### Hawaii expenses of QHTBs

The thirty-four QHTBs spent a combined total of \$197.5 million in 2021 as operating expenses or capital expenditures for sales and activities performed in Hawaii.

Table 12 presents where the QHTBs made the spending in 2021. By detailed categories, ‘Specialty Software Development’, ‘Ocean Engineering’, and ‘Seed Propagation/Seed Corn’ subsector received \$25-50 million each in 2021, comprising more than half of total spending made by the thirty-four QHTBs. Spending by the certified QHTBs showed more concentration in two subsectors. About 60% of the combined spending of \$65.8 million by the nine certified QHTBs occurred either in the “Seed Propagation/Seed Corn’ or ‘Ocean Engineering’ subsector.

Table 12. Areas where QHTBs spent their operating and capital expense in 2021

Sector	All QHTBs (34)		Certified QHTBs (9)	
	\$ million	% of total	\$ million	% of total
<b>All sectors</b>	<b>\$ 197.5</b>	<b>100.0%</b>	<b>\$ 65.8</b>	<b>100.0%</b>
<b>Information/Communication Technology</b>	<b>\$ 59.9</b>	<b>30.0%</b>	<b>\$ 0.1</b>	<b>0.1%</b>
- Specialty Software Development	\$ 49.6	25.1%	\$ 0.1	0.1%
- Testing & Evaluation	\$ 3.5	1.8%		
- Telecommunications/Networks	\$ 3.4	1.7%		
- Information Services	\$ 3.2	1.6%		
- Other	\$ 0.2	0.1%		
<b>Ocean Science</b>	<b>\$ 36.9</b>	<b>18.7%</b>	<b>\$ 21.0</b>	<b>31.9%</b>
- Ocean Engineering	\$ 29.8	15.1%	\$ 13.9	21.2%
- Other	\$ 7.1	3.6%	\$ 7.1	10.8%
<b>Biotechnology/Life Sciences</b>	<b>\$ 28.4</b>	<b>14.4%</b>	<b>\$ 0.2</b>	<b>0.4%</b>
- Biologics/Vaccines	\$ 18.5	9.4%		
- Diagnostics/Therapeutics	\$ 7.8	4.0%		
- Bioinformatics/Biophotonics	\$ 1.3	0.6%		
- Medical Devices	\$ 0.2	0.1%	\$ 0.2	0.4%
- Other (Nutraceuticals)	\$ 0.6	0.3%		
<b>Agricultural Biotechnology</b>	<b>\$ 25.3</b>	<b>12.8%</b>	<b>\$ 25.2</b>	<b>38.4%</b>
- Seed Propagation/Seed Corn	\$ 25.2	12.8%	\$ 25.2	38.4%
- Aquaculture	\$ 0.03	0.0%		
- Forestry	\$ 0.03	0.0%		
<b>Defense/Aerospace</b>	<b>\$ 11.2</b>	<b>5.7%</b>	<b>\$ 7.2</b>	<b>10.9%</b>
- Remote Sensing	\$ 6.0	3.0%	\$ 6.0	9.1%
- Photonics	\$ 0.5	0.3%		
- Information Services	\$ 0.1	0.0%		
- Optics	\$ 0.02	0.0%		
- Other	\$ 4.6	2.3%	\$ 1.2	1.8%
<b>Energy</b>	<b>\$ 10.9</b>	<b>5.5%</b>	<b>\$ 1.1</b>	<b>1.7%</b>
- Energy Efficiency	\$ 4.3	2.2%	\$ 1.1	1.7%
- Renewable Fuels	\$ 3.2	1.6%		
- Solar	\$ 3.1	1.6%		
- Waste-to-Energy	\$ 0.2	0.1%		
<b>Environmental</b>	<b>\$ 4.1</b>	<b>2.1%</b>	<b>\$ 4.0</b>	<b>6.1%</b>
- Water Technologies	\$ 3.2	1.6%	\$ 3.2	4.8%
- Disaster Mitigation Management	\$ 0.1	0.0%		
- Other	\$ 0.8	0.4%	\$ 0.8	1.3%
<b>Film/Digital Media</b>	<b>\$ 0.7</b>	<b>0.3%</b>	<b>\$ 0.3</b>	<b>1.0%</b>
- Digital Media	\$ 0.3	0.2%	\$ 0.3	0.5%
- Mobile Technologies	\$ 0.3	0.2%	\$ 0.3	0.5%
- Content Development	\$ 0.03	0.0%	\$ 0.03	0.1%
<b>Astronomy</b>	<b>\$ 0.4</b>	<b>0.2%</b>	<b>\$ 0.2</b>	<b>0.4%</b>
- Remote Sensing	\$ 0.2	0.1%	\$ 0.2	0.4%
- Adaptive Optics	\$ 0.1	0.1%		
- Precision Mechanics	\$ 0.03	0.0%		
- Modeling & Simulation	\$ 0.01	0.0%		
Unidentified	\$ 19.8	10.0%	\$ 6.1	9.1%

## 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 Hawaii regardless of the research expenses the QHTB made in the previous years. Reflecting the change, the average amount of credit claimed per QHTB was much bigger than the average credit claimed for the 2013-2019 tax years. For the tax year 2021, the average credit claimed per QHTB was \$0.39 million, and the average per-QHTB credit claimed by the nine certified QHTBs was \$0.67 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 thirty-four QHTBs spent a combined total of \$66.8 million in research activities in Hawaii in 2021, of which 20% (\$13.3 million) was claimed for the tax credit. The portion of research expense funded from out-of-state sources was very small. Of the thirty-four QHTBs, six QHTBs (one of which was certified) reported that some of their research expense was funded from out-of-state sources.<sup>1</sup> In aggregate, only about 2% of the total research expense spent in the tax year 2021 was funded from out-of-state sources.

Table 13. Research expenses and tax credit claimed for the tax year 2021

Research expenses/credit claimed	All QHTBs (34)	Certified QHTBs (9)
Eligible research expense in Hawaii (aggregate)	\$ 66.8M (100%)	\$ 30.0M (100%)
---funded from out-of-state source (aggregate)	\$ 1.5M (2.2%)	\$ 1.0M (3.5%)
Credit claimed (aggregate)	\$ 13.3M	\$ 6.0M <sup>1</sup>
--- per QHTB	\$ 0.39M	\$ 0.67M

<sup>1</sup> \$ 6.0M were claimed by the nine certified QHTBs but \$5M were certified due to \$5M aggregate annual cap

The amount of credit each individual QHTB claimed varied significantly, ranging from less than \$5,000 to over \$2 million. Among all QHTBs, eleven QHTBs (32.4%) claimed less than

<sup>1</sup> All the six QHTBs were Hawaii based companies.

\$50,000 and three of them were certified this year. On the other hand, six QHTBs (17.6%) claimed over \$1 million credit including one of which claimed over \$2.5 million credit. Three of the six QHTBs were certified this year. The highest amount of credit certified for a QHTB this year was \$1.8 million.

Table 14. QHTBs by the amount of credit claimed

Credit claimed	Among all QHTBs (34)		Among certified QHTBs (9) <sup>1</sup>	
	Number of QHTBs	% of total	Number of QHTBs	% of total
Under \$50K	11	32.4%	3	33.3%
\$50K - \$100K	4	11.8%	1	11.1%
\$100K – \$500K	12	35.3%	2	22.2%
\$500K- \$1M	1	2.9%	0	0.0%
\$1M and over	6	17.6%	3	33.3%

<sup>1</sup> Based on the amount claimed. There was a QHTB whose credit was certified only partially.

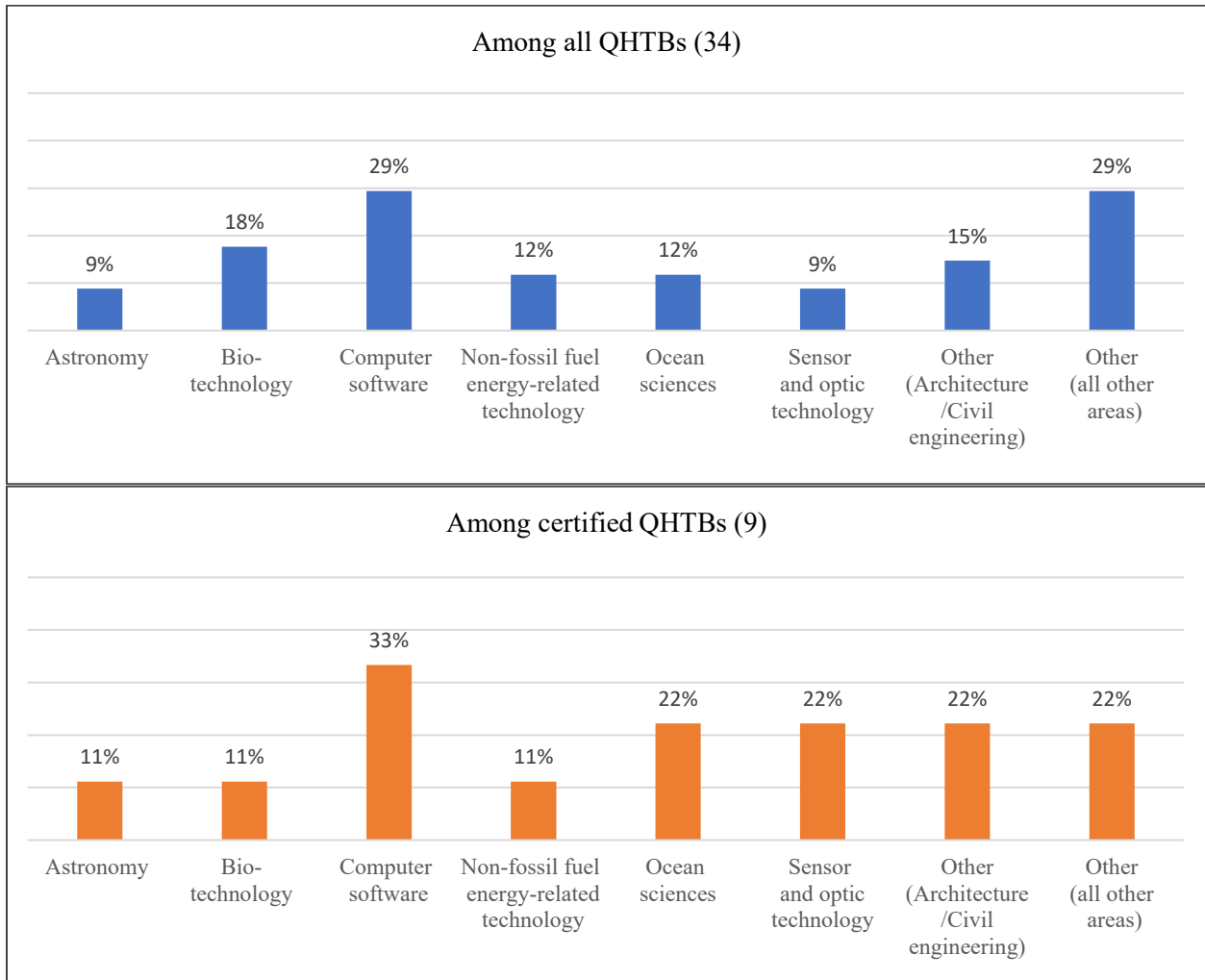
### Areas of research

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 number of QHTBs that conducted research in each area allowing multiple counts of a QHTB if it conducted research in multiple areas. Among all QHTBs that applied for the credit, ‘Computer software’ and ‘Biotechnology’ were the most widely held research areas.

The highest concentration of research of the nine certified QHTBs was also found in ‘Computer software’. One in three of the certified QHTBs conducted research in ‘Computer software’ in 2021. The next most popular areas of research among the certified QHTBs were ‘Ocean science’ and “Sensor and optic technology” with two QHTBs having conducted research in each of these areas.

‘Architectures and Civil engineering’ was not included in the definition of ‘Qualified research’, but was reported by some companies (15% of the thirty-four QHTBs and 22% of the nine certified QHTBs), so reported separately in the chart.

Figure 4. Areas where research was conducted in 2021

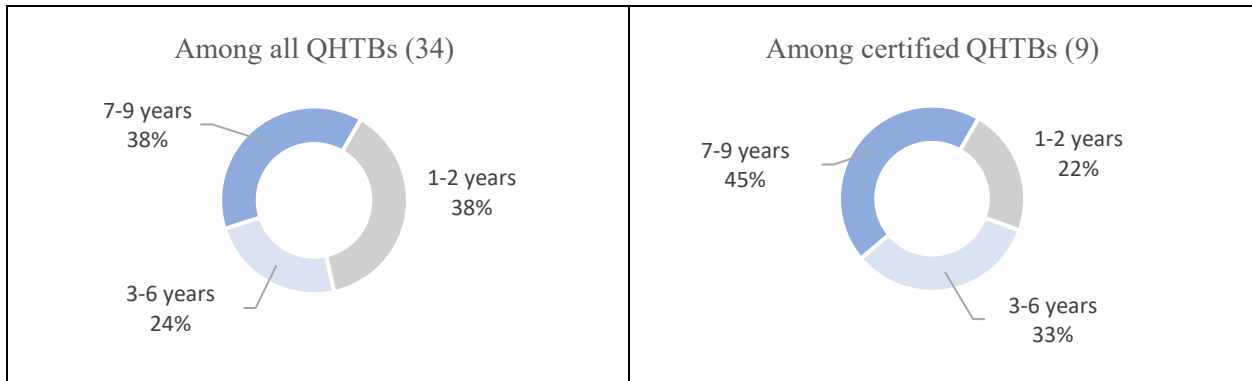


### History of claiming the tax credit since 2013 <sup>2</sup>

Among the thirty-four QHTBs that applied for this year’s tax credit, about 40% applied for the credit for the first time since the new version of the credit was introduced last year while another about 40% have applied for the credit almost every year since 2013 when the old version of the credit was introduced. The large number of the first-time applicants since last year may suggest that removing the condition of referencing to the previous years in determining the eligible amount of research expenses may have encouraged more businesses to apply for the state tax credit.

<sup>2</sup> 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 2013-2020 and didn’t reveal its previous filing in the 2021 survey, then it was not captured.

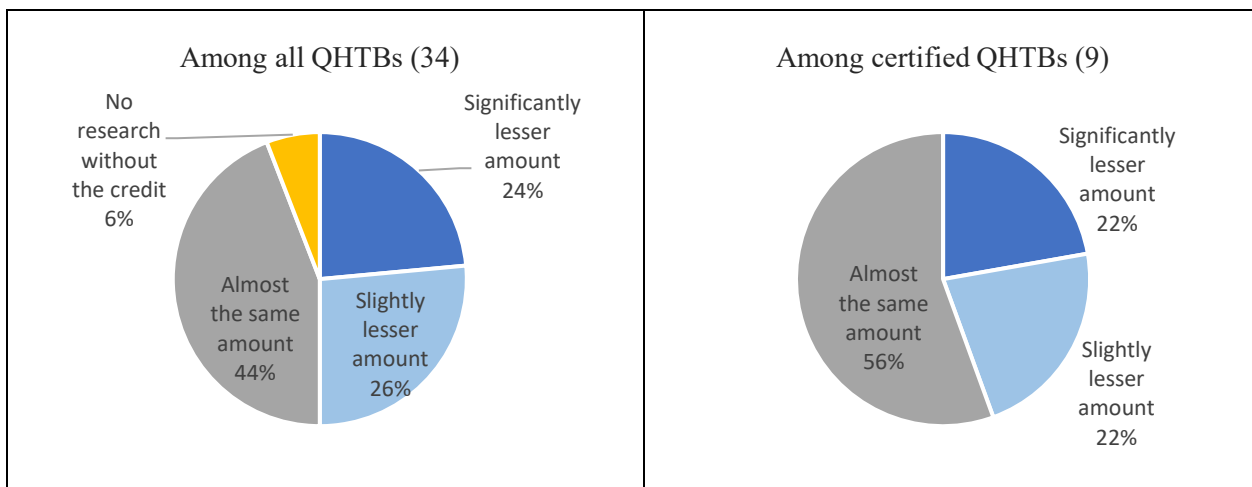
Figure 5. History of claiming the tax credit since 2013



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 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. Of the thirty-four QHTBs, fifteen QHTBs (44%) answered that they would have made almost the same amount of research spending. The percentage of those QHTBs was even higher among the certified QHTBs at 56%. The QHTBs who answered that they would have made none or significantly lesser amount of research spending without the state credit was 30% of all QHTBs and 22% of the certified QHTBs. 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, 2021, a total of 1,028 employees were working in a regular position at the thirty-four QHTBs. Most of them, 89.5%, 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 among the QHTBs. More than two third of their regular employees were employed for research activities. The companies also hired a combined total of 127 workers on a temporary or seasonal basis during the calendar year 2021, almost all of them in research areas. Looking at the certified QHTBs only, the proportion of full- time jobs and the proportion of research jobs among regular jobs were higher at 95.0% and 88.8% respectively.

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

Type of jobs	All QHTBs (34)			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	1,028	710	69.1%	399	351	88.8%
Full-time	920	655	71.2%	379	339	89.4%
Part-time	108	55	50.9%	20	12	60.0%
Temporary/seasonal	127	124	97.6%	116	113	97.4%

### Employment size

The company size 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 150. About half of the QHTBs were small sized with ten or less employees, of which four QHTBs were particularly small with none or one employee. Of the thirty-four QHTBs, three QHTBs (8.8%) had more than one hundred employees as of December 2021.

Table 16. QHTBs by the size of employment

Number of regular employees <sup>1</sup> (as of December 12, 2021)	Among all QHTBs (34)		Among certified QHTBs (9)	
	Number of QHTBs	% of total	Number of QHTBs	% of total
0-1	4	11.8%	2	22.2%
2-10	11	32.4%	2	22.2%
11-50	12	35.3%	3	33.3%
51-100	4	11.8%	0	0.0%
Over 100	3	8.8%	2	22.2%

<sup>1</sup> Includes both full-time and part-time employees but excludes temporary and seasonal employees

Job changes in QHTBs from the prior year

In aggregate, the number of jobs at the thirty-four QHTBs in 2021 showed a small decrease from the prior year. At the individual company level, however, the job performance was almost evenly mixed among “increase”, “no change”, and “decrease” from the prior year. This is similar to the job performance observed for the 40 QHTBs that applied for the last year’s tax credit. It showed no clear sign of positive impacts of the research tax credit on job creation in high-tech companies but at the same time no significant impact of the pandemic, that resulted a 15% decrease from 2019 to 2020 in total non-farm wage and salary jobs in Hawaii, was observed in these research oriented high-tech companies.

Table 17. Changes in total employment from 2020 to 2021

Type of Employment		Aggregate of all 34 QHTBs	Aggregate of 9 certified QHTBs
Full-time & Part-time	In all areas	-34	-28
	In research activities	-29	-21
Full-time	In all areas	-46	-26
	In research activities	-46	-19
Part-time	In all areas	12	-2
	In research activities	17	-2

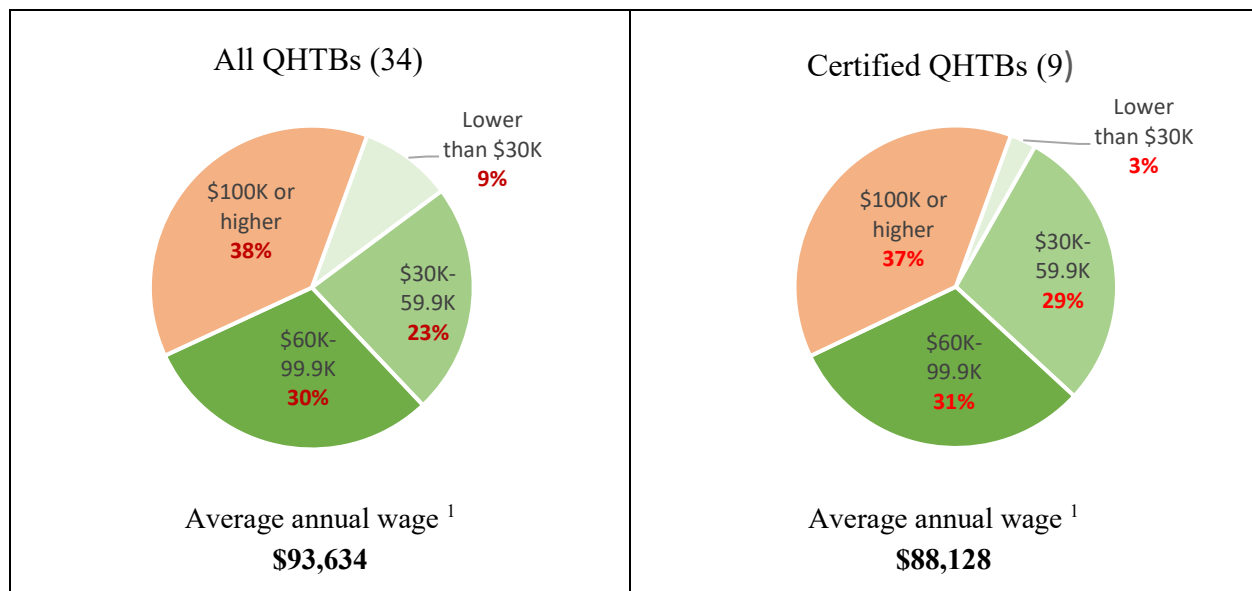
Table 18. QHTBs by the status of job change from the prior year

Change in regular jobs from 2020 to 2021		Among all QHTBs (34)		Among certified QHTBs (9)	
		Number of QHTBs	% of total	Number of QHTBs	% of total
In all jobs	Increase	13	38.2%	4	44.4%
	No change	10	29.4%	3	33.3%
	Decrease	11	32.4%	2	22.2%
In research jobs	Increase	10	29.4%	4	44.4%
	No change	13	38.2%	3	33.3%
	Decrease	11	32.4%	2	22.2%

Wages

Figure 7 presents the wage distribution of full-time employees at the QHTBs. Over a third of full-time employees at the thirty-four QHTBs were paid at least \$100,000 annually and the average annual wage, weighted by the number of full-time employees at each QHTB, was \$93,634. The wage distribution of full-time employees at the nine certified QHTBs were quite similar but the average annual wage was a little lower.

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



<sup>1</sup> Weighted by the number of full-time employees at the QHTB

To portray various compensation levels at high tech companies in Hawaii, Table 19 presents the distribution of QHTBs by the average annual wage of full-time employees at the QHTB. Of thirty-one QHTBs that had at least one full time employee as of December 2021 and reported its average annual wage in the survey, fourteen QHTBs had an average annual wage of \$100,000 or higher while eight 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 (34)		Among certified QHTBs (9)	
	Number of QHTBs	% of total	Number of QHTBs	% of total
Under 50K	2	5.9%	0	0.0%
\$50K - \$74.9K	6	17.6%	2	22.2%
\$75K - \$99.9K	9	26.5%	3	33.3%
\$100K - \$149.9K	10	29.4%	4	44.4%
\$150K – 199.9K	2	5.9%	0	0.0%
\$200K and higher	2	5.9%	0	0.0%
No full-time employee or average wage not reported <sup>1</sup>	3	8.8%	0	0.0%

<sup>1</sup> There were 2 QHTBs with no full-time employee. Among 32 QHTBs with at least one full-time employee, 1 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 Hawaii. Among the thirty-four QHTBs, twenty-one QHTBs (61.8%) reported that they hired independent contractors or procured external services in 2021. They spent a combined total of \$23.9 million to hire or procure a total of 419 contractors or external services for jobs performed in Hawaii. The bulk of this spending, 70.7%, was made in 'Scientific and Technical Contract Services'.

To assess spill-over effects of QHTBs' research activities on other companies in Hawaii 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 2021.

Table 20. Impacts of QHTBs’ activities on external companies in Hawaii in 2021

	All QHTBS (34)	Certified QHTBs (9)
Independent contractor expenses incurred by the QHTBs	\$23.9M	\$6.6M
Total number of independent contractors hired/external services procured by the QHTBs	419	198
Number of new companies established in Hawaii to commercialize the QHTBs’ intellectual property	0	0

# **Appendix**

Table A- 1. List of QHTBs that applied for Hawaii research tax credit for the tax year 2021

Company name	Business Location	Certified
Hawaii Aerospace Corporation	Honolulu, Hawaii	Yes
HiPoint Software, LLC	Honolulu, Hawaii	Yes
Limtiaco Consulting Group, Inc.	Honolulu, Hawaii	Yes
Lowney, Inc.	Oakland, California	Yes
Makai Ocean Engineering, Inc.	Honolulu, Hawaii	Yes
Nalu Scientific, LLC	Honolulu, Hawaii	Yes
Oceanit Laboratories, Inc.	Honolulu, Hawaii	Yes
Ozolio Inc.	Kahului, Hawaii	Yes
Pioneer Hi-Bred International, Inc.	Wilmington, Delaware	Yes (partial)
Architects Hawaii Limited & Subsidiaries	Honolulu, Hawaii	No
Big Island Pain	Hilo, Hawaii	No
Blue Planet Energy Systems	Honolulu, Hawaii	No
BWA Design, LLC	Honolulu, Hawaii	No
eHana LLC	Boston, Massachusetts	No
H NU Photonics LLC	Kahului, Hawaii	No
Hawaii Biotech, Inc.	Honolulu, Hawaii	No
Innov8 Solutions, LLC	Honolulu, Hawaii	No
Kamakura Corporation	Honolulu, Hawaii	No
Ken Onion Hawaii, LLC	Honolulu, Hawaii	No
Kuehnle AgroSystems, Inc.	Honolulu, Hawaii	No
LiveAction, Inc.	Palo Alto, California	No
Martin Defense Group, LLC	Honolulu, Hawaii	No
Mauna Kea Infrared, LLC	Hilo, Hawaii	No
Minatoishi Palumbo Architects, Inc.	Honolulu, Hawaii	No
MLS Hawaii, Inc. (dba Hawaii Information Service)	Honolulu, Hawaii	No
Navatek Capital, Inc.	Honolulu, Hawaii	No
Setapick Labs, LLC (dba Launch School)	Scottsdale, Arizona	No
Shrimp Improvement Systems, LLC	Kailua-Kona, Hawaii	No
Simonpietri Enterprises, LLC	Kailua, Hawaii	No
Spirent Communications Hawaii, LLC	Honolulu, Hawaii	No
Sustainable Bioresources, LLC	Naalehu, Hawaii	No
Syngenta Seeds LLC and Affiliates	Wilmington, Delaware	No
VisionSafe Corporation	Honolulu, Hawaii	No
Zillow Group Inc. & Subsidiaries	Seattle, Washington	No

Table A- 2. Business area of QHTBs in 2021 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 (34)	Among certified QHTBs (9)
Agricultural Biotechnology	Aquaculture	1	0
	Forestry	1	0
	Plant Tissue Culture	5	1
	Seed Propagation/Seed Corn	5	1
	Tropical Fruit & Biotech beverages	1	0
	Other	2	1
Astronomy	Adaptive Optics	1	0
	Modeling & Simulation	3	1
	Photonics	3	1
	Precision Mechanics	2	0
	Remote Sensing	3	2
Biotechnology/ Life Sciences	Bioinformatics/ Biophotonics	1	0
	Biologics/ Vaccines	2	0
	Contract Research Organization	1	0
	Diagnostics/Therapeutics	1	1
	Healthcare IT	1	0
	Medical Devices	3	2
	Other	2	0
Defense/Aerospace	Communications & Computer Systems	1	1
	Modeling/Simulation/Training	2	1
	Optics	2	1
	Photonics	1	0
	Remote Sensing	3	2
	Specialty Software Development	2	1
	Testing & Evaluation	2	1
	Other	3	2
Energy	Distributed Generation	1	0
	Energy Efficiency	4	1
	Renewable Fuels	3	1
	Solar	2	0
	Waste-to-Energy	1	0
	Other	1	1



Table A- 2. Business area of QHTBs in 2021 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 (34)	Among certified QHTBs (9)
Environmental	Air Technologies	1	1
	Disaster Mitigation Management	2	1
	Soil Technologies	1	1
	Water Technologies	2	2
	Other	1	1
Film/ Digital Media	Mobile Technologies	1	1
Information/Communication Technology	Information Services	6	1
	Laser	2	1
	Optics	2	1
	Photonics	3	2
	Remote Sensing	3	2
	Specialty Software Development	8	1
	Telecommunications/Networks	1	0
	Testing & Evaluation	2	0
	Other	1	1
Ocean Sciences	Fisheries	1	0
	Ocean Engineering	4	2
	Remote Sensing	1	1
Other sectors	Architecture/Civil Engineering Design	4	2
	Others	2	0