
Report on
Hawaii Tax Credit for Research Activities
for Tax Year 2020

August 2021

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	11
- Revenue structure	11
- Hawaii expenses of QHTBs	14
5. Research Activities and Tax Credit	16
- Research activities	16
- Areas of research	17
- History of claiming the credit since 2013	18
- Self-reported impact of the 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 2020	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 12/31/2020	9
Table 5. QHTBs by the number of patents owned or pending as of 12/31/2020	9
Table 6. Business areas of QHTBs in 2020	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	13
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 2020	15
Table 13. Research expenses and tax credit claimed for the tax year 2020	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 employment (full-time and part-time) from 2019 to 2020	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 2020	24
Table A-1. List of QHTBs that applied for Hawaii research tax credit for tax year 2020	26
Table A-2. Business areas of QHTBs in 2020 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 2020	18
Figure 5. History of having claimed the credit since 2013	19
Figure 6. Self-reported impact of the credit on the 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 2020. 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 forty-two QHTBs applied for the Hawaii tax credit for research activities for the tax year 2020 by submitting an executed Form N-346A. Among them, forty QHTBs completed the application by submitting the required DBEDT survey.
- The forty QHTBs spent a combined total of \$66.4 million in research activities in Hawaii in 2020, of which 20% (\$13.3 million) was claimed for the credit. Almost 99% of the research spending was funded locally.
- DBEDT issued certificates to ten QHTBs, for the total of \$5 million credit certified, based on first-come first-served rule verifying the information submitted. The tenth 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 was much bigger this year than in the 2013-2019 tax years. For the tax year 2020, the average credit claimed by all QHTBs was \$0.33 million, and the average credit claimed by the certified QHTBs was \$0.55 million. In comparison, the average credit claimed in eighty-five claims made by twenty-nine QHTBs that submitted DBEDT survey for the tax years 2013-2019 was \$0.11 million.
- The amount of credit that individual QHTB claimed varied significantly ranging from less than \$500 to over \$3 million. Among the forty QHTBs, seventeen QHTBs (42.5%) claimed the credit of less than \$50,000. On the other hand, three QHTBs claimed the credit of over \$1 million including one of which claimed the credit of over \$3 million. The highest amount of the credit certified for a QHTB this year was \$1.8 million.
- The certified QHTBs tended to be larger than the average size of all applicants although size was not employed as a factor for certification. The share of the ten certified QHTBs out of all forty applicants was 38% of total credit claimed, 36% of total employees hired, and 49% of total revenue, all larger than their proportion (25%) to the total number of applicants.

- There were eight QHTBs (one of which was certified) that provided a business address outside Hawaii. Each of the remaining thirty-two 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 had a long history of doing business with 70% of all QHTBs established in or before 2010. Among the certified QHTBs, only one was newly established in 2020 while the other nine QHTBs have been in business at least for 20 years. They also had a long history of doing research, as most of them reported the history of their research as almost the same length as the history of their company.
- A total of 1,843 patents were reported to be owned or pending as of 12/31/2020 by the forty QHTBs. However, around 85% of the patents were owned by a single mainland-based company. More than half of the QHTBs didn't own a single patent. QHTBs with more than 10 patents were 20% of all forty QHTBs and ten certified QHTBs.
- The 'Information and Communication Technology' sector was the most popular business sector among QHTBs, followed by the 'Biotechnology and Life Sciences' sector. The 'Agricultural Biotechnology' sector was the third most popular with six QHTBs in the sector, but none of the six QHTBS were certified for the credit this year.
- The forty QHTBs generated a combined revenue of a little over \$200 million from all goods and services produced in Hawaii and spent about the same amount as operation or capital expense for goods and services produced in Hawaii. There were seven QHTBs with revenue over \$10 million of which five QHTBs were certified this year.
- The forty QHTBs depended 42.7% of their revenue on out-of-state sales on average. However, the average dependence of the certified QHTBs on out-of-state sales was much smaller at 16.1%.
- The QHTBs were either highly dependent on out-of-state sales or not at all, with not many QHTBs in between. About half of the QHTBs (43% of all QHTBs and 50% of the certified QHTBs) sold all of their Hawaii produced goods and services locally with no out-of-state sales at all. On the other hand, 33% of all QHTBs and 20% of the certified QHTBs sold more than 80% of Hawaii produced goods and services to outside markets.
- On average, the QHTBs earned about half of their revenue from intellectual property produced in Hawaii. The share of revenue from intellectual property was lower among the certified QHTBs than among all QHTBs (44.2% vs. 54.8%).

- As of December 12, 2020, there were a total of 1,187 employees working in a regular position at the forty QHTBs. Most of them, 94.6%, were in a full-time position. Since the condition to be a QHTB is to conduct more than 50% of its activities in qualified research the share of research jobs was high among the QHTBs. About two out of three regular employees were employed for research activities.
- In aggregate, the number of jobs at the QHTBs showed an increase of 41 jobs in 2020 from the prior year. However, a job increase was not shared by all QHTBs. Among the forty QHTBs, a job increase was observed only in fourteen QHTBs (35%) while the remaining had no change or a decrease in jobs from the prior year. A job increase was more frequently observed among the certified QHTBs, with six out of ten QHTBs having reported a job increase from 2019 to 2020.
- About 60% of full-time employees at the forty QHTBs were paid \$60,000 and more annually, of which about half were paid more than \$100,000 annually. The share of high-paying jobs was noticeably higher among the certified QHTBs. Forty percent of full-time employees at the certified QHTBs were paid \$100,000 or higher annually and another 41% were paid \$60,000-\$100,000. This is also reflected in the average annual wage of the certified QHTB at \$100,753, which was about 20% higher than the average annual wage of all QHTBs at \$84,365.
- Among the forty QHTBs, twenty-seven QHTBs (67.5%) have hired independent contractors or procured external services in 2020, spending a combined total of \$37.5 million to hire or procure a total of 522 contractors or external services for jobs performed in Hawaii. The bulk of this spending, 80%, was made in the area of ‘Scientific and Technical Contract Services’.
- 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 2020.

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

	All QHTBs	Certified QHTBs
Number of QHTBs	40	10 ¹
% of QHTBs with a Hawaii business address	80%	90%
Research		
Research expense incurred in Hawaii (aggregate)	\$66.4M	\$27.6M
per QHTB	\$1.7M	\$2.8M
% funded from out-of-state sources	1.1%	1.3%
Tax credit claimed (aggregate)	\$13.3M	\$5.5M ²
per QHTB	\$331K	\$507K
-QHTBs with credit “Under \$100K”	(60.0%)	(40.0%)
-QHTBs with credit “\$100K-\$500K”	(22.5%)	(20.0%)
-QHTBs with credit “\$500K-\$1M”	(10.0%)	(30.0%)
-QHTBs with credit “\$1M or over”	(7.5%)	(10.0%)
Tax credit certified (aggregate)	\$5M	\$5M
Top two areas of research	Biotechnology Computer software	Computer software Ocean science
Patents (owned or filed)		
-QHTBs with “0” patent	(55.0%)	(60.0%)
-QHTBs with “1-10” patents	(25.0%)	(20.0%)
-QHTBs with “over 10” patents	(20.0%)	(20.0%)
Revenue/Expense		
Revenue (aggregate)	\$209.7M	\$102.4M
per QHTB	\$5.2M	\$10.2M
% of revenue from out of state sales	42.7%	16.1%
% of revenue from intellectual properties	54.8%	44.2%
Operation expenses (aggregate)	\$191.6M	\$82.3M
Capital expenditure (aggregate)	\$3.6M	\$1.6M
Employment ³		
Number of employees (aggregate)	1,187	426
per QHTB	29.7	42.6
Research jobs as % of total jobs	64.8%	75.8%
Job changes from 2019		
-QHTBS with job “Increase”	(35.0%)	(60.0%)
-QHTBS with job “No change”	(50.0%)	(30.0%)
-QHTBS with job “Decrease”	(15.0%)	(10.0%)
Avg. annual wage of full-time employee		
Weighted average of QHTBs ⁴	\$84,365	\$100,753
-QHTBs with avg. wage “Under \$75K”	(41.2%)	(22.2%)
-QHTBs with avg. wage “\$75K- \$99.9K”	(29.4%)	(22.2%)
-QHTBs with avg. wage “\$100K- \$149.9K”	(23.5%)	(44.4%)
-QHTBs with avg. wage “\$150K or over”	(5.8%)	(11.1%)

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

2. \$5.5M were claimed by the ten 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 to be 20% of the qualified research expenditures and continues 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 credit to complete an annual survey with 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 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 required 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 first 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 2020. 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 credit under section 41 of the Internal Revenue Code. This section summarizes how many businesses applied for the Hawaii tax credit for research activities for the tax year 2020 and how many of them were certified.

A total of forty-two QHTBs applied for the Hawaii research activity tax credit for the tax year 2020 by submitting an executed Form N-346A by March 31st, 2021. Among those, forty QHTBs completed the application by submitting the required DBEDT survey.

DBEDT issued certificates to ten QHTBs based on first-come first-served rule verifying the information submitted. The first nine QHTBs were certified for full amount they claimed while the tenth QHTB was certified for a partial amount of the credit claimed, due to the \$5 million aggregate annual cap. Throughout this report, ‘all QHTBs’ or ‘all applicants’ refers to the forty QHTBs that completed the application by submitting the DBEDT survey, and the ‘certified

QHTB' refers to the ten QHTBs including the tenth QHTB of which claimed credit was partially certified.

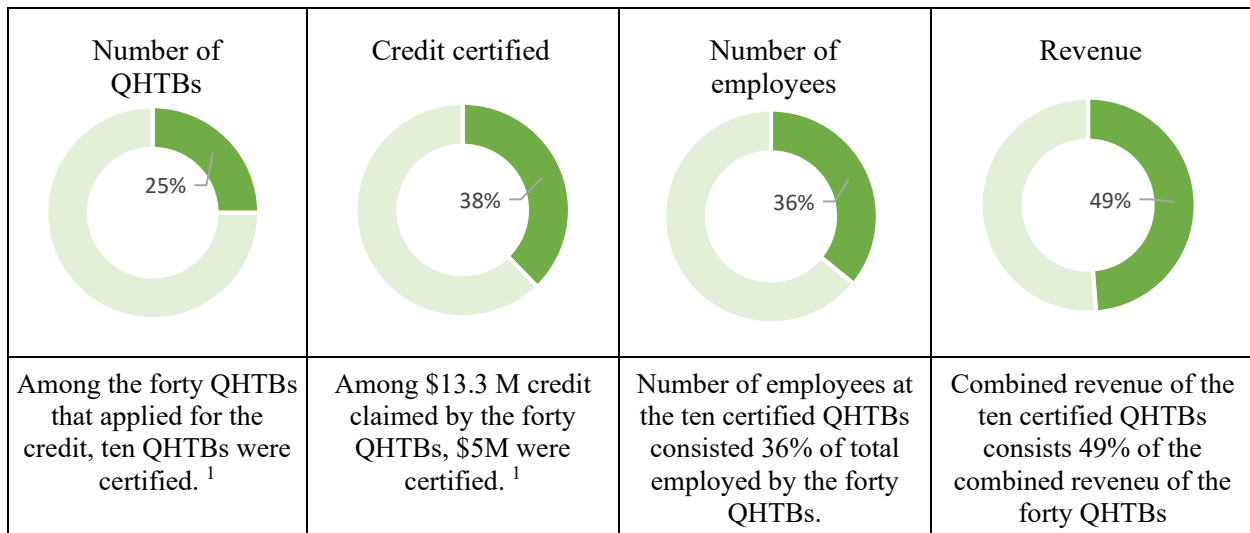
Table 1. Application and certification of Hawaii Research Tax Credit, tax year 2020

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
42	40	10	9	1

The certified QHTBs tended to be larger than the average size of all applicants although size was not employed as a factor for certification. The share of the ten certified QHTBs out of all forty applicants was 38% of total credit claimed, 36% of total employees hired, and 49% of total revenue, all larger than their proportion (25%) to the total number of applicants.

While a few small and newer companies were also included among the certified, half of the certified QHTBs were relatively big with revenue from Hawaii activities bigger than \$10 million. Figure 1 shows the share of the ten certified QHTBs among all forty applicants in the four major aspects mentioned above.

Figure 1. Share of the certified QHTBs among all applicants



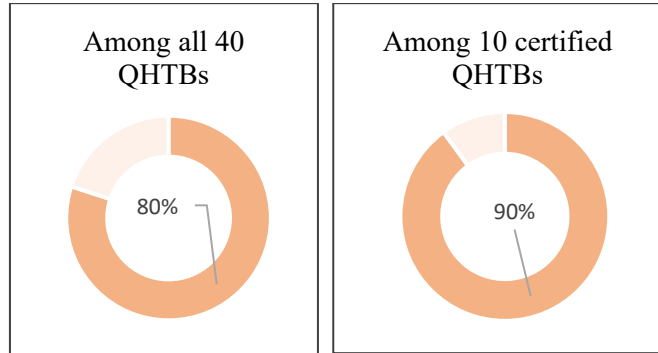
1. The tenth QHTB was certified for a partial amount of the credit it claimed due to the annual cap of \$5 million to be certified

3. Characteristics of QHTBs

Business location

There were eight QHTBs (one of which was certified) that provided a business address outside Hawaii. Each of the remaining 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 (4), Delaware (2), Massachusetts (1) and Nevada (1).

Figure 2. QHTBs with Hawaii business address



History of doing business and research

Many QHTBs had a long history of doing business with 70% of all QHTBs established in or before 2010. Among the certified QHTBs, only one was newly established in 2020 while the other nine QHTBs have been in business at least for twenty years.

Table 2. QHTBs by the year established

	Year when it was established					
	all	~ 1990	1991-2000	2001-2010	2011-2015	2016 and after
All QHTBs (40)	100%	25.0%	17.5%	27.5%	12.5%	17.5%
Certified QHTBs (10)	100%	70.0%	20.0%	0.0%	0.0%	10.0%

The history of their doing research was almost same as the history of the company for the majority of the QHTBs (85% of all QHTBs and 100% of the certified QHTBs). The seven QHTBs that were conducting the research for five or less years were mostly a newer company that was established less than five years ago. Only six out of the forty QHTBs reported the years of research history much shorter than the history of the QHTB.

Table 3. History of research activities

	Years of doing research				
	all	1-5 years	6-10 years	11-20 years	More than 20 years
All QHTBs (40)	100%	17.5%	22.5%	30.0%	30.0%
Certified QHTBs (10)	100%	10.0%	0%	10.0%	80.0%

Intellectual properties

A total of 1,843 patents were reported to be owned or pending as of 12/31/2020 by all QHTBs. However, around 85% of the patents were owned by a single company. That company was one of the eight mainland-based companies and was not certified this year.

Table 4. Aggregate number of patents owned or pending as of 12/31/2020

	Patents as of 12/31/2020		
	Owned or pending	Owned	Pending
All QHTBS (40)	1,843	1,777	66
Certified QHTBs (10)	90	47	43

Table 5 shows the distribution of the QHTBs by the number of patents owned by the company. More than half of the QHTBs didn't own a single patent. QHTBs with more than 10 patents were 20% of all forty QHTBs and ten certified QHTBs.

Table 5. QHTBs by the number of patents owned or pending as of 12/31/2020

Patents owned or pending	Among all QHTBs (40)		Among certified QHTBs (10)	
	Number of QHTBs	% of total	Number of QHTBs	% of total
0 (no patent)	22	55.0%	6	60.0%
1-10 patents	10	25.0%	2	20.0%
11-50 patents	5	12.5%	1	10.0%
51-100 patents	2	5.0%	1	10.0%
Over 100 patents	1	2.5%	0	0.0%

Business areas

The survey asked each QHTB to indicate all industry sectors in which the QHTB conducted business in 2020. Eight major business sectors consisting of eighty-four subsectors were provided in the survey as business categories. By broad category, 80% of the QHTBs indicated that they conducted business only in one business sector while 20% of the QHTBs indicated that they did business in multiple sectors.

Table 6. Business areas of QHTBs in 2020

Business sectors		Number of QHTBs	
		Among all QHTBs (40)	Among certified QHTBs (10)
One sector only	Agricultural Biotechnology	5	0
	Biotechnology/Life Sciences	5	2
	Defense/ Aerospace	1	0
	Energy	1	0
	Environmental	1	0
	Information/ Communication Technology	9	3
	Ocean Sciences	3	2
	Other (Architecture)	3	1
	Other one sector	4	0
Doing business in more than one sector		8	2

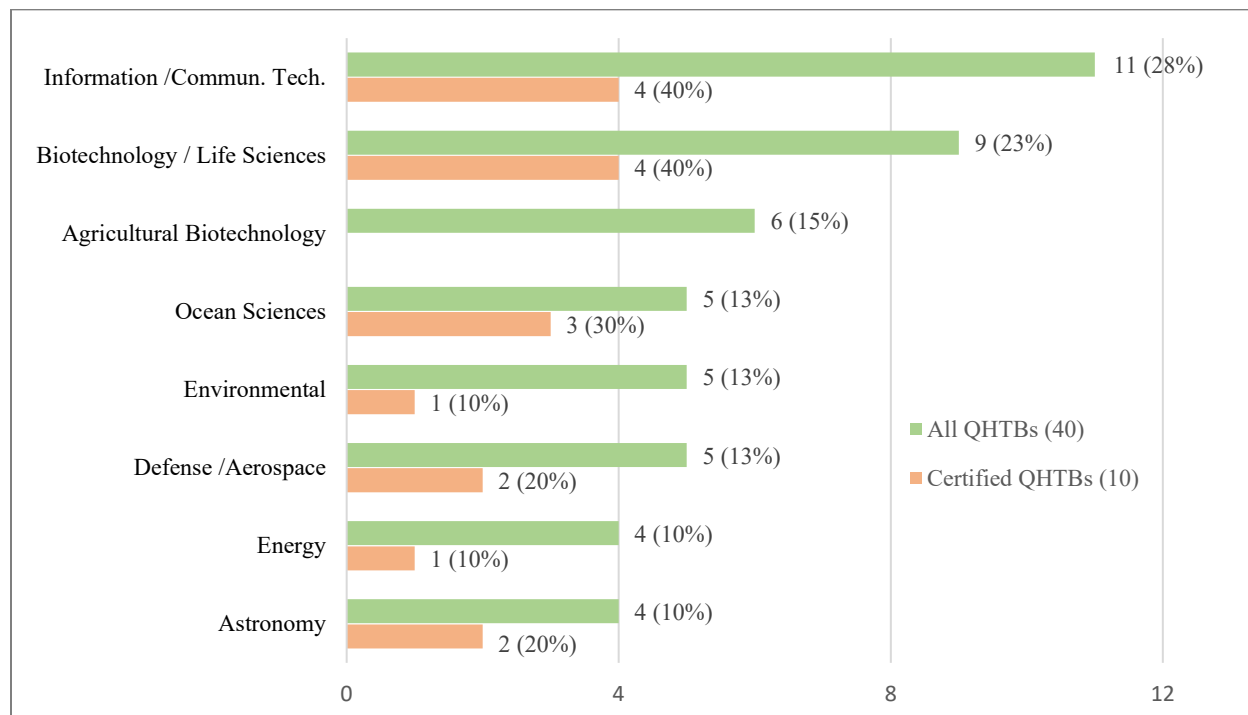
Figure 3 shows total number of QHTBs that conducted business in each industry sector in 2020, counting the multi-sector company multiple times for all industry sectors they did business in.

The ‘Information and Communication Technology’ sector was the most popular business sector among the forty QHTBs, followed by the ‘Biotechnology and Life Sciences’ sector. These two sectors were also the most popular business sectors among the certified QHTBs. ‘Agricultural Biotechnology’ was the third most popular with six QHTBs in the sector, but none of the six QHTBS were certified for the credit this year.

Table A-2 in the appendix at the end of this report shows business activities of QHTBs by detailed business category. ‘Medical devices’ in the ‘Biotechnology and Life Sciences’ sector was the most prevalent business activity amongst the QHTBs. Six QHTBs were doing business

in this sub-sector in 2020. The next popular sub-sectors were ‘Photonics’ in the ‘Astronomy’ sector, ‘Remote Sensing’ in the ‘Defense/Aerospace’ sector, and ‘Energy Efficiency’ in the ‘Energy’ sector with four QHTBs doing business 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 in which they did business.

4. Revenue and Spending Structure

Revenue structure

Table 7 presents the aggregated amount of revenue and expenses of all QHTBs and certified QHTBs for the tax year 2020. The forty QHTBs generated a combined revenue of a little over \$200 million from all goods and services produced in Hawaii, spent about the same amount as operation or capital expense for goods and services produced in Hawaii, and paid a total of \$94 million as payroll expense. Although only a quarter of the QHTBs were certified, the ten certified QHTBs consists about half of the aggregate amount of revenue and each expense. That means that on average the certified QHTBs was bigger than the average of all QHTBs that applied for the credit. While the certified QHTBs included a few small companies with less than

\$1million of annual revenue, half (five QHTBs) of them were big with over \$10 million of annual revenue from goods and services produced in Hawaii. The proportion of QHTBs with over \$10 million of revenue was much bigger among the certified QHTBs than among all QHTBs (50% vs. 17.5%).

Table 7. Aggregate amount of revenue and expenses

Revenue/Expenses	All QHTBs (40)	Certified QHTBs (10)
Revenue ¹	\$209.7M	\$102.4M
Operating cost ¹	\$191.6M	\$82.3M
Capital expenditures ¹	\$3.6M	\$1.6M
Payroll expense ²	\$94.0M	\$42.9M

¹ Earned from or incurred for all goods and services produced in Hawaii

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

Table 8. QHTBs by the size of revenue

Revenue ¹	Among all QHTBs (40)		Among certified QHTBs (10)	
	Number of QHTBs	% of total	Number of QHTBs	% of total
Under \$100K ²	9	22.5%	1	10.0%
\$100K - \$1M	8	20.0%	2	20.0%
\$1M - \$5M	10	25.0%	2	20.0%
\$5M - \$10M	6	15.0%	0	0.0%
Over \$10M	7	17.5%	5	50.0%

¹ Earned from or incurred for all goods and services produced in Hawaii

² Includes 5 QHTBs with zero revenue (1 among the certified)

The QHTBs depended 42.7% of their revenue on out-of-state sales on average. However, the portion of out-of-state sales was much smaller among the certified QHTBs. Only 16.1% of their total revenue were from out-of-state sales while the other 83.9% of their revenue were from local sales.

On average, the QHTBs earned about half of their revenue from intellectual property produced in Hawaii. The share of revenue from intellectual property was lower among the certified QHTBs than among all QHTBs (44.2% vs. 54.8%).

Table 9. Aggregate amount of revenue by source

	All QHTBs (40)		Certified QHTBs (10)	
	\$ million	% of total revenue	\$ million	% of total revenue
Total revenue	\$209.7	100%	\$102.4	100%
By source of revenue				
- from out-of-state sales	\$89.6	42.7%	\$16.5	16.1%
- from intellectual property ¹	\$114.8	54.8%	\$45.2	44.2%
- from intellectual-property-based out-of-state sales ¹	\$75.9	36.2%	\$13.4	13.1%

¹ Intellectual property produced in Hawaii

Although the aggregate amounts help us to understand average behaviors or characteristics of the QHTBs, they are heavily weighted on and representative of the large companies. Dependence on out-of-state sales and intellectual property-based sales varied significantly by QHTB. Their distributions are summarized in Table 10 and 11.

The QHTBs were either highly dependent on out-of-state sales or not at all, with not many QHTBs in between. About half of the QHTBs (43% of all QHTBs and 50% of the certified QHTBs) sold all of their Hawaii produced goods and services locally with no out-of-state sales. On the other hand, 33% of all QHTBs and 20% of the certified QHTBs sold more than 80% of Hawaii produced goods and services to outside markets.

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 (40)		Among certified QHTBs (10)	
	Number of QHTBs	% of total	Number of QHTBs	% of total
0%	17	42.5%	5	50.0%
1-20%	3	7.5%	2	20.0%
21-50%	0	0.0%	0	0.0%
51-80%	2	5.0%	0	0.0%
Over 80%	13	32.5%	2	20.0%
NA (no revenue)	5	12.5%	1	10.0%

Similar patterns were observed in the share of intellectual property-based sales. QHTBs were either highly dependent on intellectual property-based sales or not at all. Among the thirty-five revenue-producing QHTBs in the tax year 2020, thirteen QHTBs had more than 80% of their revenue from intellectual property produced in Hawaii while eighteen QHTBs had no revenue from intellectual property produced in Hawaii. Not all the thirteen QHTBs with high dependence on intellectual property-based sales owned patents. Eight of them didn't own a patent at all but had other intellectual property such as copy rights, trade secrets, and trademarks.

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

Dependence of revenue on intellectual property-based sales or activities ¹	Among all QHTBs (40)		Among certified QHTBs (10)	
	Number of QHTBs	% of Total	Number of QHTBs	% of total
0%	18	45.0%	4	40.0%
1-20%	1	2.5%	0	0.0%
21-50%	2	5.0%	2	20.0%
51-80%	1	2.5%	0	0.0%
Over 80%	13	32.5%	3	30.0%
NA (no revenue)	5	12.5%	1	10.0%

¹ Intellectual property produced in Hawaii

Hawaii expenses of QHTBs

The forty QHTBs spent a combined total of \$195.1 million in 2020 as operating expenses or capital expenditures for sales and activities performed in Hawaii.

Table 12 presents where the QHTBs made the spending in 2020. By detailed categories, the ‘Specialty Software Development’, ‘Information and Communication for Architecture and Engineering Design’, and ‘Ocean Engineering’ subsector received \$30-40 million each in 2020, comprising more than half of total spending made by the forty QHTBs. Spending by the certified QHTBs showed more concentration in two subsectors. About 70% of the combined spending of \$83.9 million by the certified QHTBs occurred either in the ‘Information and Communication for Architecture and Engineering Design’ or ‘Ocean Engineering’ subsector.

Table 12. Areas where QHTBs spent their operating and capital expense in 2020

	All QHTBs (40)		Certified QHTBs (10)	
	\$ million	% of total	\$ million	% of total
All sectors	\$ 195.1	100.0%	\$ 83.9	100.0%
Information/Communication Technology	\$ 61.5	31.5%	\$ 9.0	10.7%
- Specialty Software Development	\$ 38.2	19.6%	\$ 4.1	4.9%
- Telecommunications/Networks	\$ 18.4	9.4%		
- Information Services	\$ 4.9	2.5%	\$ 4.9	5.8%
Architecture and Engineering Design	\$ 37.9	19.4%	\$ 28.6	34.1%
- In Information/Communication	\$ 32.1	16.4%	\$ 28.6	34.1%
- In Environmental	\$ 5.9	3.0%		
Ocean Science	\$ 29.4	15.1%	\$ 27.6	32.9%
- Ocean Engineering	\$ 29.4	15.1%	\$ 27.6	32.9%
Energy	\$ 14.4	7.4%	\$ 1.5	1.8%
- Energy Efficiency	\$ 4.8	2.4%	\$ 1.5	1.8%
- Renewable Fuels	\$ 3.4	1.7%		
- Solar	\$ 3.3	1.7%		
- Distributed Generation	\$ 3.0	1.5%		
Biotechnology/Life Sciences	\$ 12.6	6.5%	\$ 5.1	6.1%
- Biologics/Vaccines	\$ 4.8	2.5%	\$ 4.8	5.7%
- Medical Devices	\$ 4.2	2.1%	\$ 0.3	0.4%
- Diagnostics/Therapeutics	\$ 2.5	1.3%		
- Other (Dietary Supplements)	\$ 1.1	0.6%		
Defense/Aerospace	\$ 12.4	6.4%	\$ 8.8	10.5%
- Remote Sensing	\$ 7.1	3.6%	\$ 6.5	7.7%
- Photonics	\$ 0.5	0.3%	\$ 2.3	2.7%
- Other	\$ 4.8	2.5%		
Agricultural Biotechnology	\$ 9.8	5.0%		
- Aquaculture	\$ 9.1	4.7%		
- Forestry	\$ 0.6	0.3%		
- Plant Tissue Culture	\$ 0.03	0.0%		
Environmental	\$ 7.5	3.8%		
- Water Technologies	\$ 7.5	3.8%		
Astronomy	\$ 1.1	0.5%	\$ 0.2	0.2%
- Remote Sensing	\$ 0.6	0.3%		
- Adaptive Optics	\$ 0.3	0.1%		
- Precision Mechanics	\$ 0.1	0.1%	\$ 0.1	0.2%
- Modeling & Simulation	\$ 0.06	0.0%	\$ 0.1	0.1%
Film/Digital Media	\$ 0.4	0.2%		
- Other (Webcam streaming)	\$ 0.4	0.2%		
Unidentified	\$ 8.2	4.2%	\$ 3.2	3.8%

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 this year than in the 2013-2019 tax years. For the tax year 2020, the average credit claimed by all QHTBs was \$0.33 million, and the average credit claimed by the certified QHTBs was \$0.55 million. In comparison, the average credit claimed in eighty-five claims made by twenty-nine QHTBs that submitted DBEDT survey for the tax years 2013-2019 was \$0.11 million.

The forty QHTBs spent a combined total of \$66.4 million in research activities in Hawaii in 2020, of which 20% (\$13.3 million) was claimed for the credit. The portion of research expense funded from out-of-state sources was very small. Of the forty QHTBs, six QHTBs (one of which was certified) reported that some of their research expense was funded from out-of-state sources.¹ In aggregate, only a little over 1% of the total research expense spent in the tax year 2020 was funded from out-of-state sources.

Table 13. Research expenses and tax credit claimed for the tax year 2020

	All QHTBs (40)	Certified QHTBs (10)
Eligible research expense in Hawaii (aggregate)	\$ 66.4 M (100%)	\$ 27.6 M (100%)
---funded from out-of-state source (aggregate)	\$ 0.73 M (1.1%)	\$ 0.35 M (1.3%)
Credit claimed (aggregate)	\$ 13.3 M	\$ 5.5 M ¹
--- per QHTB	\$ 0.33 M	\$ 0.55 M

¹ \$5.5M were claimed by the ten certified QHTBs but \$5M were certified due to \$5M aggregate annual cap

¹ All the six QHTBs were Hawaii based companies.

The amount of credit that individual QHTB claimed varied significantly ranging from less than \$500 to over \$3 million. Among all QHTBs, seventeen QHTBs (42.5%) claimed the credit of less than \$50,000. Only one of them were certified this year. On the other hand, three QHTBs claimed the credit of over \$1 million including one of which claimed the credit of over \$3 million. One of the three QHTBs was certified this year. The highest amount of the 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 (40)		Among certified QHTBs (10) ¹	
	Number of QHTBs	% of total	Number of QHTBs	% of total
Under \$50K	17	42.5%	1	10.0%
\$50K - \$100K	7	17.5%	3	30.0%
\$100K – \$500K	9	22.5%	2	20.0%
\$500K- \$1M	4	10.0%	3	30.0%
\$1M and over	3	7.5%	1	10.0%

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

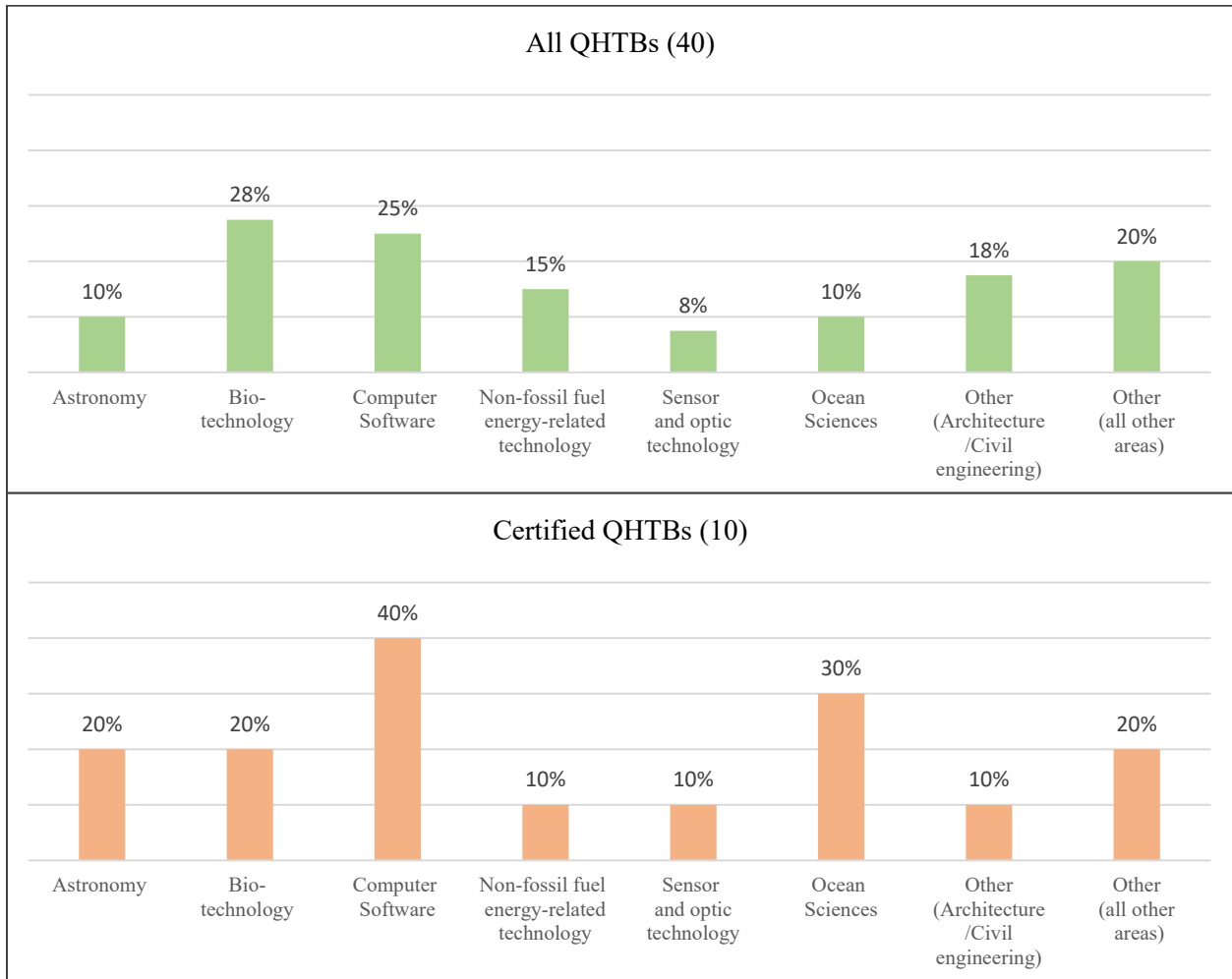
Areas of research

Businesses were asked to indicate in which area(s) they conducted research during the year. Seven research areas 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. ‘Biotechnology’ and ‘Computer Software’ were the most widely held research areas among all QHTBs. At least a quarter of the QHTBs conducted research in each of the areas.

The certified QHTBs showed the most concentration on ‘Computer Software’ research. Four out of the ten certified QHTBs conducted research in this area in the tax year 2020. The second most popular area of research among the certified QHTBs was ‘Ocean Science’ with three QHTBs having conducted research in this area.

Research in ‘Architectures and Civil Engineering’ were not included in the definition of ‘Qualified research’, but reported by a few companies, so reported separately in the charts (18% of the forty QHTBs and 10% of the ten certified QHTBs).

Figure 4. Areas where research was conducted in 2020



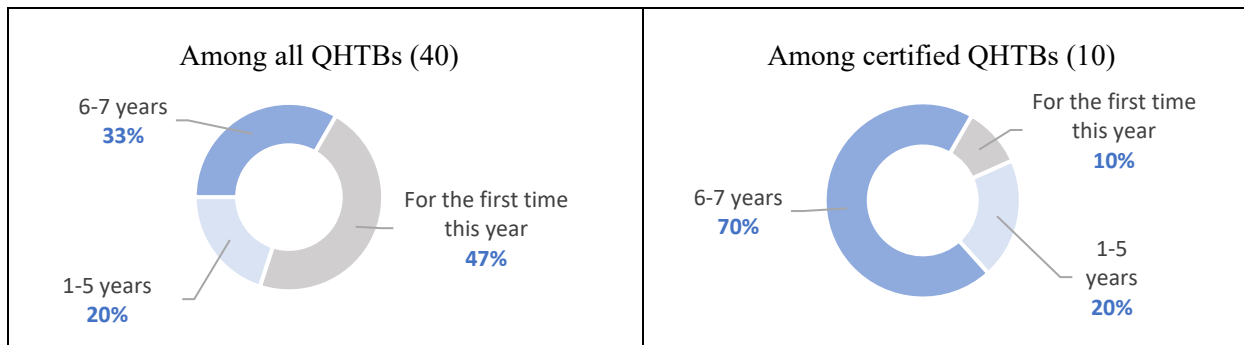
History of claiming the credit since 2013 ²

About half of all QHTBs have claimed the previous version of Hawaii research tax credit that was offered for the tax years 2013-2019 at least once. Another half of them claimed the credit for the tax year 2020 for the first time since 2013. The large number of first-time applicants 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 credit this year.

² History of claiming the credit was based on what the QHTB reported in the 2020 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 survey, then it was not captured.

As far as the state research credit is concerned, the certified QHTBs showed more experience. Seven out of the ten certified QHTBs had claimed the state credit almost every year since 2013. The only first-time applicant that was certified this year was a new company established in 2020.

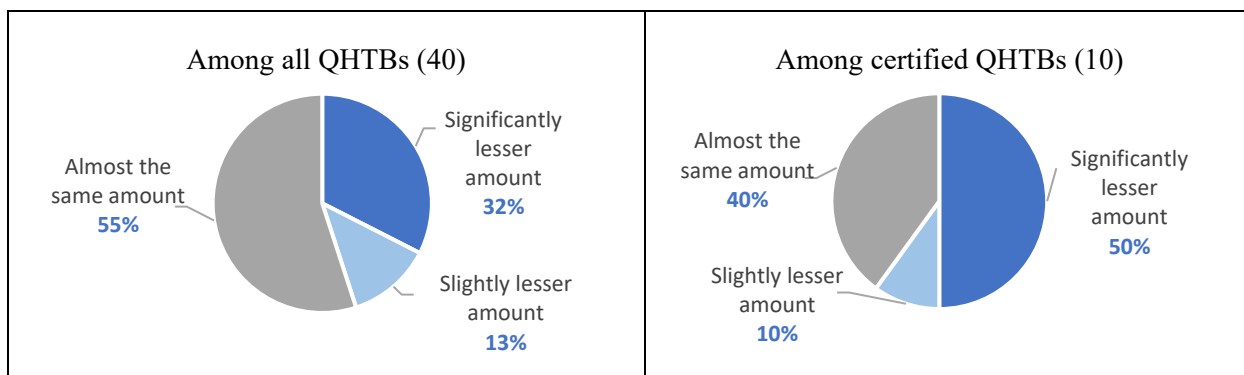
Figure 5. History of having claimed the credit since 2013



Self-reported impact of the credit on research spending

It is not an easy task assessing the true impacts of the state research 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 forty QHTBs, twenty-two QHTBs (55%) answered that they would have made almost the same amount of research spending. Although the percentage was a little lower at 40% among the certified QHTBs, still a significant number of QHTBs expressed that their research spending for the tax year 2020 was not affected by the state credit. It’s possible that is either because their decision on research spending was dominantly determined by factors other than the credit or because it takes time until the extension of the credit affects actual spending. The percentage of the QHTBs that answered that it would have made significantly lesser amount of research spending without the state research credit was 32% among all QHTBs and 50% among the certified QHTBs.

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



6. Jobs and Wages

Employment overview

As of December 12, 2020, there were a total of 1,187 employees working in a regular position at the forty QHTBs. Most of them, 94.6%, were in a full-time position. Since the condition to be a QHTB is to conduct more than 50% of its activities in qualified research the share of research jobs was high among the QHTBs. About two out of three regular employees were employed for research activities. The companies also hired a combined total of 34 workers on a temporary or seasonal basis during the calendar year 2020, 28 of them in research areas. Looking at the certified QHTBs only, the share of full-time jobs among regular jobs was a little lower at 90.6% but the share of research jobs was higher at 75.8%.

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

	All QHTBs (40)			Certified QHTBs (10)		
	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	1,187	769	64.8%	426	323	75.8%
Full-time	1,123	733	65.3%	386	301	78.0%
Part-time	64	36	56.3%	40	22	55.0%
Temporary/seasonal	34	28	82.4%	20	16	80.0%

Employment size

The size of the QHTBs measured in the number of employees varied substantially. The number of regular employees in each QHTB, as of December 12, 2020, ranged as small as zero to as big as over two hundred. About half of the QHTBs were small sized with ten or less employees, of which eight QHTBs were particularly small with no employee or only one employee. Of the forty QHTBs, four QHTBs (10%) had more than one hundred employees as of December 2020.

Although the size of the QHTB was not considered as a factor for certification, the certified QHTBs tended to be bigger on average. The share of small companies with ten or less

employees were 30% among the certified QHTBs, smaller than 50% among all QHTBs. Of the four QHTBs with more than one hundred employees, two were certified this year.

Table 16. QHTBs by the size of employment

Number of regular employees ¹ (as of December 12, 2020)	Among all QHTBs (40)		Among certified QHTBs (10)	
	Number of QHTBs	% of total	Number of QHTBs	% of total
0-1	8	20.0%	1	10.0%
2-10	10	25.0%	2	20.0%
11-50	16	40.0%	4	40.0%
51-100	2	5.0%	1	10.0%
Over 100	4	10.0%	2	20.0%

¹ 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 all forty QHTBs showed an increase by 41 jobs in 2020 from the prior year. In fact, this increase was the result of a bigger increase in research and full-time jobs and some decrease in non-research jobs and part-time jobs.

Table 17. Changes in employment (full-time and part-time) from 2019 to 2020

Type of Employment		Aggregate of all QHTBs (40)	Aggregate of certified QHTBs (10)
Full-time & Part-time	In all areas	41	31
	In research activities	46	41
Full-time	In all areas	57	38
	In research activities	103	50
Part-time	In all areas	-16	-7
	In research activities	-57	-9

However, a job increase was not shared by all QHTBs. Among the forty QHTBs, a job increase was observed only in fourteen QHTBs (35%) while the remaining had no change or a decrease in jobs from the prior year. A job increase was more frequently observed among the certified QHTBs, with six out of ten QHTBs having reported a job increase from 2019 to 2020.

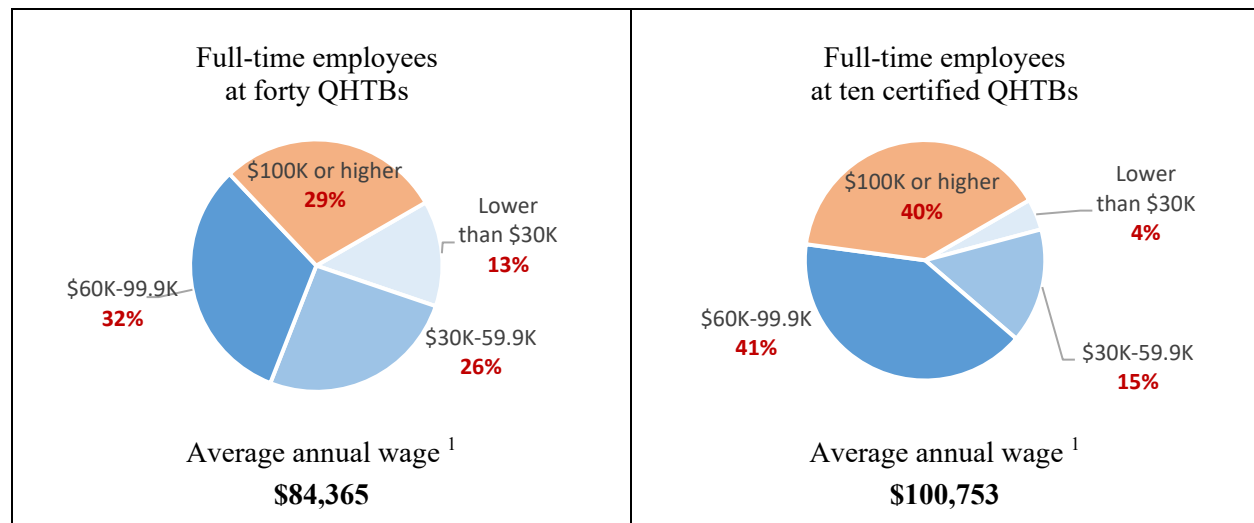
Table 18. QHTBs by the status of job change from the prior year

Change in regular jobs from 2019 to 2020		Among all QHTBs (40)		Among certified QHTBs (10)	
		Number of QHTBs	% of total	Number of QHTBs	% of total
In all jobs	Increase	14	35.0%	6	60.0%
	No change	20	50.0%	3	30.0%
	Decrease	6	15.0%	1	10.0%
In research jobs	Increase	8	20.0%	4	40.0%
	No change	24	60.0%	4	40.0%
	Decrease	8	20.0%	2	20.0%

Wages

Figure 7 presents the distribution of 1,123 full-time employees at all QHTBs and 386 full-time employees at the certified QHTBs by wage group. About 60% of full-time employees at the forty QHTBs were paid \$60,000 and more annually, of which about half were paid more than \$100,000 annually. The proportion of high-paying jobs was noticeably higher among the certified QHTBs. Forty percent of full-time employees at the certified QHTBs were paid \$100,000 or higher annually and another 41% were paid \$60,000-\$100,000. This is also reflected in the average annual wage of the certified QHTB at \$100,753, which was about 20% higher than the average annual wage of all QHTBs at \$84,365.

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



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

Since the average wages in Figure 7 were calculated by averaging the wages across all QHTBs, weighted by the number of employees at the QHTB, they were dominated by the wages of large companies. To portray various levels of compensation 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-four QHTBs that had at least one full time employee as of December 2020 and reported its average annual wage in the survey, fourteen QHTBs had an average annual wage under \$75,000. On the other side, about a quarter of the QHTBs reported an average annual wage of \$100,000 or higher.

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 (40)		Among certified QHTBs (10)	
	Number of QHTBs	% of total	Number of QHTBs	% of total
Under 50K	4	10.0%	0	0.0%
\$50K - \$74.9K	10	25.0%	2	20.0%
\$75K - \$99.9K	10	25.0%	2	20.0%
\$100K - \$149.9K	8	20.0%	4	40.0%
\$150K – 199.9K	1	2.5%	0	0.0%
\$200K and higher	1	2.5%	1	10.0%
No full-time employee or average wage not reported ¹	6	15.0%	1	10.0%

¹ There were 4 QHTBs with no full-time employee. Among 36 QHTBs with at least one full-time employee, 2 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 external companies in Hawaii. Among the forty QHTBs, twenty-seven QHTBs (67.5%) have hired independent contractors or procured external services in 2020, spending a combined total of \$37.5 million to hire or procure a total of 522 contractors or external services for jobs performed in Hawaii. The bulk of this spending, 80%, was made in the area of 'Scientific and Technical Contract Services'.

As a way to assess spill-over effects of QHTBs’ research activities to other companies in Hawaii the survey 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 2020.

Table 20. Impacts of QHTBs’ activities on external companies in Hawaii in 2020

	Aggregate of all QHTBS (40)	Aggregate of certified QHTBs (10)
Independent contractor expenses incurred by the QHTBs	\$37.5M	\$18.3M
Total number of independent contractors hired/external services procured by the QHTBs	522	268
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 2020

Company name	Business Location	Certified
Architects Hawaii & Limited & Subsidiaries	Honolulu, Hawaii	Yes (partial)
Ehana, LLC	Boston, Massachusetts	Yes
Hawaii Biotech Inc	Honolulu, Hawaii	Yes
InsightPPE LLC	Honolulu, Hawaii	Yes
Kamakura Corporation	Honolulu, Hawaii	Yes
Makai Ocean Engineering, INC.	Honolulu, Hawaii	Yes
Martin Defense Group, LLC	Honolulu, Hawaii	Yes
Mauna Kea Infrared, LLC	Hilo, Hawaii	Yes
MLS Hawaii, Inc. (dba Hawaii Information Service)	Honolulu, Hawaii	Yes
Oceanit Laboratories, Inc.	Honolulu, Hawaii	Yes
Benjamin Woo Architects	Honolulu, Hawaii	No
Blue Ocean Barns, Inc.	San Jose, California	No
Blue Planet Energy Systems	Honolulu, Hawaii	No
CG Management LLC	Kilauea, Hawaii	No
Computer Software Associates, Inc. (dba Quantify IP)	Kihei, Hawaii	No
David Ching DMD LLC	Pearl City, Hawaii	No
Domegaia LLC	Pahoa, Hawaii	No
H NU Photonics LLC	Kahului, Hawaii	No
HiPoint Software, LLC	Honolulu, Hawaii	No
Jensen Enterprises, Inc.	Reno, Nevada	No
Ken Onion Hawaii LLC	Kaneohe, Hawaii	No
Kuehnle AgroSystems Inc.	Honolulu, Hawaii	No
Limtiaco Consulting Group, Inc.	Honolulu, Hawaii	No
LiveAction, Inc.	Palo Alto, California	No
Lowney, Inc.	Oakland, California	No
MDG - RI, LLC	Honolulu, Hawaii	No
Minatoishi Palumbo Architects, Inc.	Honolulu, Hawaii	No
Nalu Scientific, LLC	Honolulu, Hawaii	No
NutriBiogenex, LLC	Honolulu, Hawaii	No
Ozolio, Inc	Kahului, Hawaii	No
Pioneer Hi-Bred International, Inc.	Wilmington, Delaware	No
Sanjole	Honolulu, Hawaii	No
Schwager Davis, Inc.	San Jose, California	No
Shrimp Improvement Systems, LLC	Kailua-Kona, Hawaii	No
Spirent Communications Hawaii, LLC	Honolulu, Hawaii	No
Sustainable Bioresources, LLC	Naalehu, Hawaii	No
Syngenta Seeds LLC and Affiliates	Wilmington, Delaware	No
TruTag Technologies, Inc.	Kapolei, Hawaii	No
VisionSafe Corporation	Kaneohe, Hawaii	No
Volk Innovations, LLC	Honolulu, Hawaii	No

Table A- 2. Business area of QHTBs in 2020 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 (40)	Among certified QHTBs (10)
Agricultural Biotechnology	Aquaculture	2	2
	Floriculture	2	2
	Forestry	1	1
	Plant Tissue Culture	1	1
	Seed Propagation/Seed Corn	2	2
	Other	2	2
Astronomy	Adaptive Optics	2	1
	Modeling & Simulation	2	0
	Photonics	4	2
	Precision Mechanics	1	0
	Remote Sensing	3	1
Biotechnology/ Life Sciences	Biologics/Vaccines	1	1
	Contract Research Organization	1	0
	Diagnostics/Therapeutics	2	1
	Healthcare IT	1	0
	Medical Devices	6	2
	Other	1	0
Defense/Aerospace	Antenna Systems & Management	1	1
	Communications & Computer Systems	1	1
	Information Services	1	1
	Modeling/Simulation/Training	1	1
	Optics	3	2
	Photonics	3	2
	Remote Sensing	4	2
	Specialty Software Development	1	1
	Testing & Evaluation	1	1
	Other	2	1
Energy	Energy Efficiency	4	1
	Renewable Fuels	2	1
	Solar	2	0
	Other	2	1

Table A- 2. Business area of QHTBs in 2020 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 (40)	Among certified QHTBs (10)
Environmental	Air Technologies	1	1
	Disaster Mitigation Management	1	1
	Soil Technologies	1	0
	Water Technologies	2	1
	Other	4	1
Information/Communication Technology	Information Services	3	3
	Modeling/Simulation/Training	1	1
	Photonics	1	0
	Remote Sensing	1	0
	Specialty Software Development	6	2
	Telecommunications/Networks	3	0
	Testing & Evaluation	2	1
Other	1	1	
Ocean Sciences	Ocean Engineering	4	3
	Remote Sensing	1	0