Report on

Hawaii Tax Credit for Research Activities

for Tax Year 2015

August 2016

Department of Business, Economic Development and Tourism

State of Hawaii

STATE OF HAWAII • DEPARTMENT OF BUSINESS, ECONOMIC DEVELOPMENT & TOURISM

Table of Contents

Executive Summary 1

1. Introduction 4

2. Characteristics of QHTBs 5

- Age of QHTBs 5
- Intellectual property 5
- Business sector of QHTBs 6

3. Revenue and Spending Structure 7

- Revenue structure of QHTBs 7
- Hawaii expenses of QHTBs 8

4. Research Activities and Tax Credit 10

5. Job Characteristics and Creation 11

- Employment overview 11
- Employment size 12
- Compensation levels of jobs in QHTBs 12
- Job changes in QHTBs from the previous year 13

6. Impacts of QHTBs' Activities on External Companies 14

7. Tax Credit Claimed with the State Department of Taxation 15

Appendix 16

List of Tables

Table S1. Summary statistics on the characteristics and activities of QHTBs 3

Table 1. QHTBs by year established 5

Table 2. History of research activities 5

Table 3. Patents owned or filed by QHTBs 6

Table 4. Other intellectual property owned by QHTBs 6

Table 5. Business areas of QHTBs in 2015 6

Table 6. Revenues of QHTBs, by revenue source 8

Table 7. Operating and Capital expenditure spent by QHTBs in 2015 8

Table 8. Where QHTBs spent their operating and capital expenditures in 2015 9

Table 9. Reported research expenses and tax credit for tax year 2015 11

Table 10. Number of employments employed by QHTBs, by employment status 12

Table 11. QHTBs by employment size 12

Table 12. Full-time and part-time employees by wage level 13

Table 13. Employment changes in QHTBs from 2014 to 2015 14

Table 14. Impacts of QHTBs' activities on external companies in Hawaii in 2015 14

Table A-1. List of QHTBs that completed Hawaii TCRA survey 17

Table A-2. Business areas of QHTBs in 2015, by detailed activity 18

List of Figures

Figure 1. Number of QHTBS that conducted business in each sector 7

Figure 2. Areas where QHTBs conducted research in 2015 10

Figure 3. Full-time employees of QHTBs in 2015 by wage level 13

Figure A-1. Number of QHTBs that conducted business in each subsector 19

Executive Summary

- A total of twelve qualified high technology businesses (QHTBs) completed the survey with the State Department of Business, Economic Development and Tourism (DBEDT) for the Hawaii research tax credit for tax year 2015. The twelve QHTBs reported that they spent an aggregate amount of $20.1 million in research activities in Hawaii in 2015. Among those, $14.4 million (71.9 %) was eligible for the research tax credit, and a total of $1.1 million was claimed for the research tax credit in State of Hawaii tax form N346.

- Eleven QHTBs (92%) were established more than six years ago and have been undertaking the research activities for six years or longer.

- A total of 116 patents were owned or filed by seven QHTBs as of December 2015 (68: owned, 48 pending). Five QHTBs had no patents owned or filed as of December, 2015.

- "Energy" was the most prevalent business sector with Six QHTBs (50%) doing business in the sector. "Ocean Science" was another popular industry sector with five QHTBs doing business in the sector. The next were "Defense & Aerospace" and "Information & Communication Technology," holding four QHTBs each.

- In 2015, the twelve QHTBs made a total of $47.2 million revenue from all goods and services produced in Hawaii, of which 70.3% ($33.2 million) was derived from out-of-state sales or activities. About 33% of this total revenue was earned from intellectual properties that QHTBs produced in Hawaii.

- The twelve QHTBs spent $38.9 million in 2015 as operating expenses or capital expenditures for sales and activities performed in Hawaii, of which 34.0% ($13.2 million) was incurred in the "Biotechnology & Life Sciences" sector.

- As of December 2015, the twelve QHTBs had a total of 270 regular employees (246 full-time and 24 part-time employees) working for them altogether. The majority of these employees, 72.6%, were employed in research activities.

- About 80% of full-time employees in the QHTBs got paid over $60,000 annually, with more than half of them paid over $100,000 annually.
- Although job loss/gain varied by company, the aggregate number of regular jobs in the twelve QHTBs in December 2015 was 4.9% lower than they had a year ago. The majority of the job loss occurred in research activities and in part-time positions.
- Five QHTBs, 42%, reported that they had independent contractor expenses in 2015. The five QHTBs spent a total of $1.6 million to hire 52 contractors or external services for services performed in Hawaii in 2015.
- According to the State Department of Taxation, fifteen claims (including corporations and individuals) were processed as of July 29, 2016 for the state research tax credit for tax year 2015. The total amount of the fifteen claims was $390,000.

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

Characteristics	2015 tax year	2014 tax year	2013 tax year
No. of QHTB submitted TCRA survey	12 [1]	13	10
Total number of patents owned or filed	116	158	107
Popular areas of businesses [2] (number of QHTBs)	Energy(6) Ocean Science(5) Defense/Aerospace(4) Infor./Comm. Tech(4)	Defense/Aerospace (7) Energy (5) Other Sciences (5)	Defense/Aerospace(4) Biotech/Life Sci.(4) Infor./Comm.Tech (4)
Revenue/ Expense			
Avg. Revenue per QHTB	$3.9M	$4.0 M	$5.4 M
% of revenue from out of state sale	70.3%	65.2%	66.2%
% of revenue from intellectual property	32.5%	23.4%	30%
Avg. Operating expenses per QHTB	$3.2M	$3.4 M	$4.3 M
Avg. Capital expenditure per QHTB [3]	$59K	$26 K	$247 K
Research			
Total Research expense incurred in Hawaii	$20.1M	$28.1 M	$25.7 M
Total Tax credit claimed for Hawaii TCRA	$1.1M	$1.3 M	$1.1 M
Avg. Tax credit claimed for Hawaii TCRA per QHTB	$89K	$100 K	$109 K
Popular areas of research [2] (number of QHTBs)	Computer software(8) Non-Fossil Fuel(5) Ocean Science(5) Biotechnology(3)	Computer software (7) Biotechnology (5) Ocean sciences (5) Non-fossil fuel (4)	Computer software (5) Biotechnology (3) Ocean sciences (2) Non-fossil fuel (2)
Jobs [4]			
Total number of employees	270	297	338
Avg. number of employees/QHTB	22.5	22.8	33.8
Research jobs as % of total jobs	72.6%	78.5%	77.2%
Full time jobs as % of total jobs	91.1%	86.9%	82.8%
% of jobs with wage $60K or higher	76.3%	78.5%	71.7%
% of jobs with wage $100K or higher	41.5%	39.4%	31.7%
Change in total jobs from last year	-14 (-4.9%)	18 (6.5%)	-20 (-6.0%)
Change in research jobs from last year	-13 (-6.2%)	24 (11.5%)	-7 (-2.8%)

1. 8 QHTBs also completed the research tax credit survey for either tax year 2013, 2014, or both.
2. A company was counted multiple times if it conducted business/research in more than a sector.
3. Capital expenditure includes land, construction, and equipment purchase.
4. Includes both full-time and part-time jobs, but doesn't include temporary or seasonal jobs.

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. Act 221 in 2001 further augmented the benefits by allowing the credit to be claimed for all qualified research expenses, not just the incremental amount. Hawaii research tax credit was amended once more in 2004 when Act 215 limited credit eligibility to qualified high technology businesses (QHTBs) only. This old research tax credit sunsetted in 2010.

Act 270, Session Laws of Hawaii 2013, re-established Hawaii's research tax credit for tax year from 2013 to 2019. The credit remains to be 20% of the qualified research expenditures and continues to be refundable. However, it defined QHTBs more narrowly and 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 claim the state research credit to complete an annual survey with DBEDT. Based on the survey result, DBEDT is required to submit a report to the legislature on the activities of the QHTBs to measure the effectiveness of the research tax credit.

This is the third report that is prepared pursuant to Act 270. This report includes statistics on various activities of QHTBs that claimed the research tax credit for their taxable year 2015. Most statistics reported in this report are for activities undertaken in calendar year 2015.

2. Characteristics of QHTBs

For tax year 2015, a total of twelve QHTBs completed the survey with DBEDT on the Hawaii tax credit for research activities. QHTBs in this report refer to the twelve companies unless otherwise stated.

Age of QHTBs

Most QHTBs that submitted the Hawaii research tax credit survey for tax year 2015 have been doing business for many years. All QHTBs except one were established more than seven years ago. Four QHTBs were established before 1990 while seven QHTBs were established between 2000 and 2010. The company with the shortest history was established in 2012.

History of research activity was also long. 92% of the QHTBs reported that they had been undertaking the research activities for seven years or longer.

Table 1. QHTBs by year established

Year established	~ 1990	1991-1999	2000-2005	2006-2010	2011~
No. of QHTBs	4	0	2	5	1

Table 2. History of research activities

Years	1-3 years	4-6 years	7 years or longer
No. of QHTBs	1	0	11

Intellectual Properties

More than 100 patents were owned or filed with the U.S. Patents and Trademark office by the QHTBs. As of December 31, 2015, a total of 68 patents were owned by the QHTBs while another 48 patents were filed and pending. However, not all QHTBs owned or have filed patents. Among the twelve QHTBs, five QHTBs had no patent owned or filed as of December 31, 2015.

Table 3. Patents owned or filed by QHTBs (as of Dec 31, 2015)

Total number of patents owned or filed by QHTBs			No. of QHTBs with at least one patent owned or filed	No. of QHTBs with more than 10 patents owned
Total	Owned	Pending		
116	68	48	7	3

Nine QHTBs (75%) indicated that they owned intellectual property other than patents. Most QHTBs with patents also owned intellectual properties other than patents. Among the five QHTBs that had no patent owned or filed, two QHTBs reported that they owned other intellectual properties.

Table 4. Other intellectual property owned by QHTBs (as of Dec 31, 2015)

Total number of QHTBs that submitted tax credit surveys	No. of QHTBs with other intellectual property			
	Copyrights	Trade Secrets	Licenses	Trademarks
12	5	5	4	7

Business sector of QHTBs

The survey asked each QHTB to indicate all industry sectors in which the QHTB conducted business in 2015. Eight major business sectors consisting of eighty four subsectors were provided in the survey as business categories. Five QHTBs (42%) indicated that they were doing business only in one business sector whilst seven QHTBs indicated that they did business in more than one business sector.

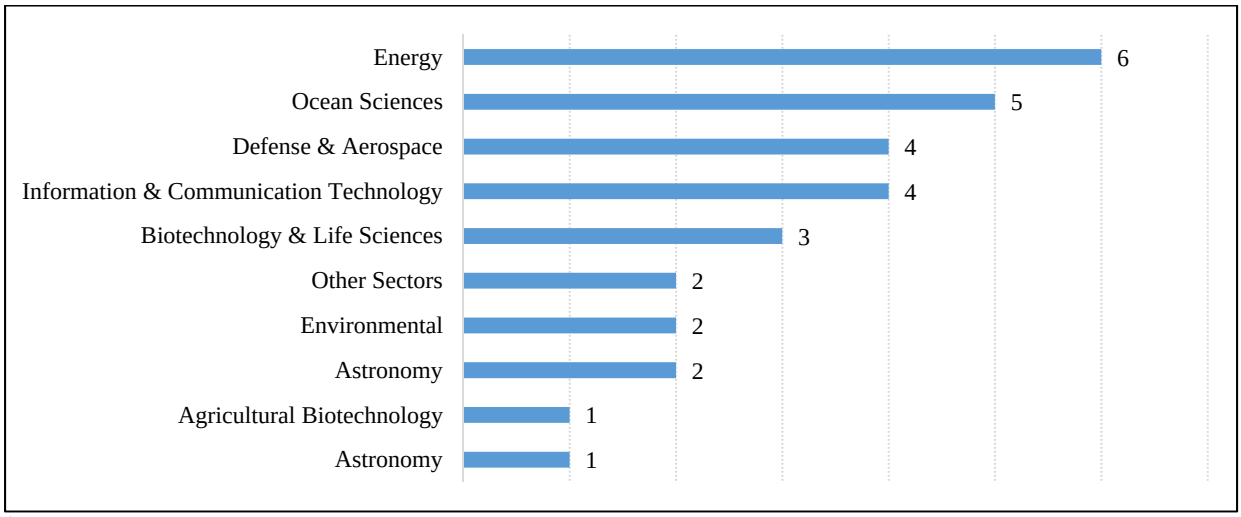
Table 5. Business areas of QHTBs in 2015 (number of QHTBs)

One sector only				Doing business in more than one sector
Astronomy	Biotechnology/ Life Science	Ocean Science	Information/ Communication	
1	1	1	2	7

Figure 1 shows total number of QHTBs that conducted business in each industry sector in 2015, counting the multi-sector companies multiple times for all industry sectors they did business in.

"Energy" sector hosted the largest number of companies. Six QHTBs (50%) indicated that they did business in this sector. "Ocean Science" was another popular industry sector with five QHTBs doing business in the sector. The next were "Defense & Aerospace" and "Information & Communication Technology," holding four QHTBs each.

Figure 1. 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.

Table A-2 and Figure A-1 in the appendix at the end of this report shows business activities of QHTBs by detailed business activity. Specialty software development in the "Information & Communication Technology" sector was the most prevalent business activity amongst the QHTBs in 2015.

3. Revenue and Spending Structure

Revenue structure of QHTBs

In 2015, the twelve QHTBs made a total of $47.2 million revenue from all goods and services produced in Hawaii, of which 70.3% ($33.2 million) was derived from out-of state sales or activities.

About 33% of this total revenue was earned from intellectual properties that QHTBs produced in Hawaii. The combined revenue of the twelve QHTBs from their intellectual properties, by selling patented products or licensing royalty, etc., was $15.3 million in 2015. 75.1% ($11.5 million) of the revenue from intellectual properties was earned from out-of-state sales.

Table 6. Revenues of QHTBs, by revenue source

Source of revenue	Revenue in 2015	
Total revenue	$47,225,964	100%
- from out-of-state sales	$33,176,626	70.3%
Revenue from intellectual property	$15,340,295	100%
- from out-of-state sales	$11,518,062	75.1%

Hawaii expenses of QHTBs

The twelve QHTBs spent $38.9 million in 2015 as operating expenses or capital expenditures for sales and activities performed in Hawaii.

Table 7. Operating and Capital expenditure spent by QHTBs in 2015

Operating Expenses spent by QHTBs	Capital Expenditures spent by QHTBs
$38,158,511	$701,165

Table 8 presents where QHTBs made the spending in 2015 by industry sector. 34.0% ($13.2 million) of the QHTBs' Hawaii expenses was incurred in "Biotechnology & Life Sciences", while another 27.7% ($10.8 million) of the spending was incurred in the "Defense & Aerospace" sector.

A subsector that received the largest QHTBs' spending in 2015 was Contract Research Organization subsector in "Biotechnology & Life Sciences". $12.7 million spending was made in this subsector in 2015. Other subsectors that received a large expenditure include Specialty Software Development subsector in "Defense & Aerospace" ($9.5million), Engineering subsector in "Ocean Science" ($5.6 million), and Specialty Software Development subsector in "Information & Communication Technology" ($1.7 million).

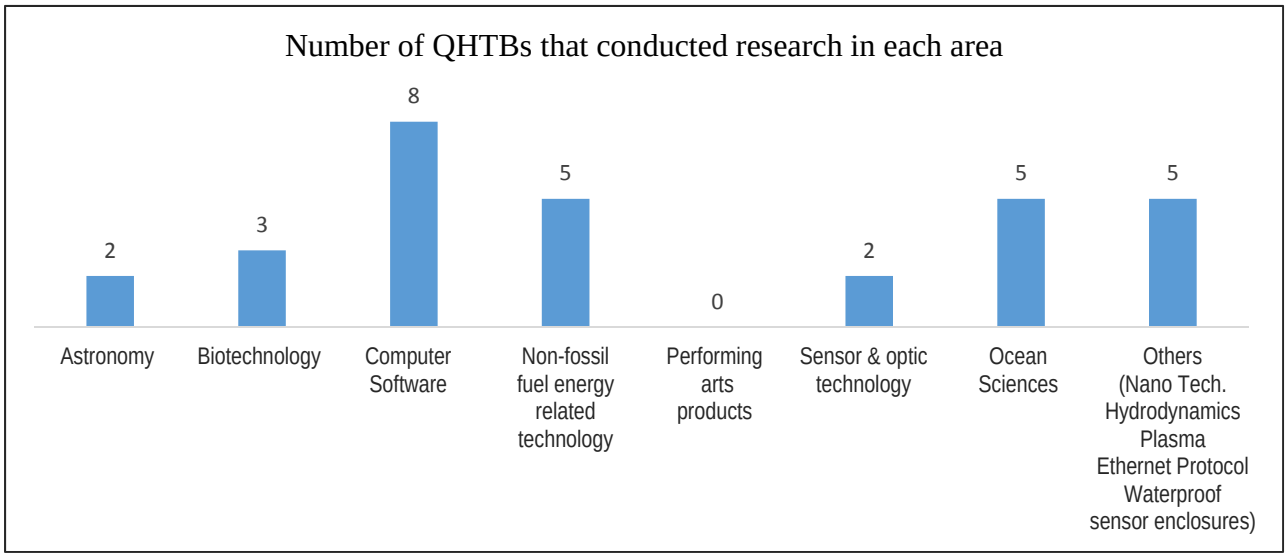
Table 8. Where QHTBs spent their operating and capital expenditures in 2015

All sectors	**$38,868,676**	**100.0%**
Biotechnology & Life Sciences	**$13,223,419**	**34.0%**
- Contract Research Organization	$12,684,377	32.6%
- Biologics/Vaccines	$479,500	1.2%
- Medical Devices	$59,542	0.2%
Defense & Aerospace	**$10,784,405**	**27.7%**
- Specialty Software Development	$9,533,002	24.5%
- Remote Sensing	$1,070,170	2.8%
- Communications & Computer Systems	$181,234	0.5%
Ocean Science	**$7,909,401**	**20.3%**
- Engineering	$5,582,253	14.4%
- Other	$2,325,148	6.0%
Information & Communication Technology	**$1,721,363**	**4.4%**
- Specialty Software Development	$1,721,363	4.4%
Energy	**$1,536,007**	**4.0%**
- Energy Efficiency	$1,119,451	2.9%
- Solar	$249,036	0.6%
- Renewable Fuels	$137,000	0.4%
- Distributed Generation	$30,520	0.1%
Environmental	**$481,576**	**1.2%**
- Disaster Mitigation Management	$481,576	1.2%
Astronomy	**$469,640**	**1.2%**
- Photonics	$464,944	1.2%
- Adaptive Optics	$4,696	0.0%
Film/Digital Media	**$201,371**	**0.5%**
- Mobile Technologies	$201,371	0.5%
Agricultural Biotechnology	**$68,500**	**0.2%**
- Aquaculture	68,500	0.2%
Unidentified	$2,474,993	6.4%

4. Research Activities and Tax Credit

Businesses were asked to indicate in which area they conducted research during the year. Seven broad categories were provided in the survey. Figure 2 presents the number of QHTBs that conducted research in each research area allowing multiple counting of a QHTB if it conducted research in multiple areas. Among the twelve QHTBs, eight companies reported that they conducted research in more than one area. "Computer Software" was the most widely held research area with eight companies having conducted research in the area in 2015. Other research area that were popular among the twelve QHTBs includes "Non-Fossil Fuel Energy Related Technology" and "Ocean Sciences". Five QHTBs conducted research in each of the areas in 2015.

Figure 2. Areas where QHTBs conducted research in 2015



For "Qualified Research Activities", Act 270 adopts §41 of the Internal Revenue Code, meaning that only incremental amounts are eligible for the credit, with the further requirement that qualified research activities do not include research expenses incurred outside of the state.

The twelve QHTBs who completed the Hawaii research credit survey for tax year 2015 reported that they spent an aggregate amount of $20.1 million in research activities in Hawaii in 2015.

Among those, $14.4 million (71.9%) was eligible for the Hawaii tax credit for research activities (TCRA), and a total of $1.1 million was claimed by the twelve QHTBs for tax credit on Form N346.

The amount that individual QHTB claimed for the Hawaii research tax credit ranged from $500 to $320,000. Three QHTBs reported that they claimed more than $100,000 for the research credit on Form N346 for tax year 2015. All QHTBs except one reported that they paid zero corporate income tax for tax year 2015.

Table 9. Reported research expenses and tax credit for tax year 2015

Total Research Expenses occurred in Hawaii	Total Research Expenses eligible for Hawaii TCRA	Total Tax Credit reported for Hawaii TCRA
$20,068,677 100%	$14,438,456 71.9%	$1,072,890

5. Job Characteristics and Creation

Employment overview

As of December 12, 2015, the twelve QHTBs had a total of 270 regular employees (246 full-time and 24 part-time employees). The majority of these employees, 72.6%, were employed in research activities, and the share of research activity jobs was a little higher in full-time jobs than in part-time jobs.

A total of 22 workers were employed on a temporary or seasonal basis by the QHTBs during the calendar year 2015. Out of the 22 temporarily or seasonally hired workers, 15 workers (68.2%) were employed to work on research activities.

Table 10. Number of employments employed by QHTBs, by employment status

	As of December 2015			Temporary / Seasonal in 2015
	Total	Full-time	Part-time	
All areas	270	246	24	22
In research activities	196	181	15	15
Research activity jobs as % of total jobs	72.6%	73.6%	62.5%	68.2%

Employment size

QHTBs that completed the research tax credit survey for tax year 2015 varied substantially in employment size. The number of regular employees that each of the QHTBs had as of December 2015 ranged from 0 to 84. There were six QHTBs that had none or less than 10 regular employees while two QHTBs had over 50 employees working for the company.

Table 11. QHTBs by employment size

Number of regular employees [1] (as of December 2015)	**No. of QHTBs**
No employee	2
1-9	4
10-24	1
25-49	3
50-75	1
75-100	1

[1] Excludes temporary and seasonal employees

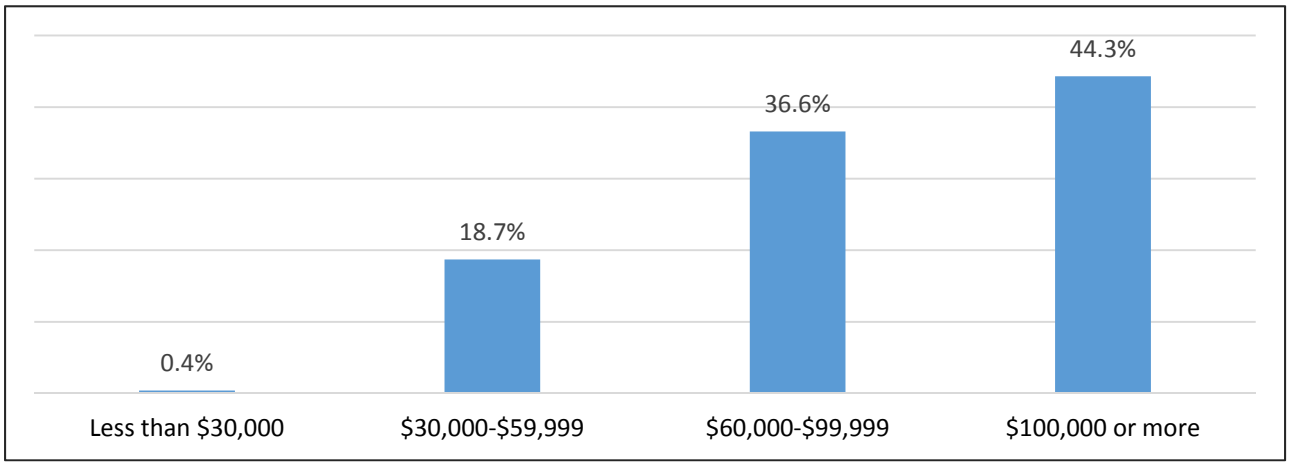
Compensation levels of jobs in QHTBs

Table 12 shows the number of employees and their shares of total employees by four wage groups. About 80% of full-time employees in the QHTBs got paid over $60,000 annually, with more than half of them paid over $100,000 annually.

Table 12. Full-time and part-time employees by wage level

Annual wage	Full & Part-time		Full-time		Part-time	
	Jobs	Percentages	Jobs	Percentages	Jobs	Percentages
Less than $30,000	13	4.8%	1	0.4%	12	50.0%
$30,000-$59,999	51	18.9%	46	18.7%	5	20.8%
$60,000-$99,999	94	34.8%	90	36.6%	4	16.7%
$100,000 or more	112	41.5%	109	44.3%	3	12.5%
Total	270	100%	246	100%	24	100%

Figure 3. Full- time employees of QHTBs in 2015 by wage level



Job changes in QHTBs from the previous year

Although job loss/gain varied by company, the aggregate number of regular jobs in the twelve QHTBs in December 2015 was 4.9% lower than they had a year ago. The majority of the job loss occurred in research areas and in the part-time positions. A total number of 196 employees were working in research activities in the twelve QHTBs in December 2015. It was 13 persons less, or 6.2% lower than the QHTBs had in December 2014.

Table 13. Employment changes in QHTBs from 2014 to 2015

Employees		2015	2014	Changes from 2014
Full-time &Part-time	In all areas	270	284	-14
	In research activities	196	209	-13
Full-time	In all areas	246	245	1
	In research activities	181	184	-3
Part-time	In all areas	24	39	-15
	In research activities	15	25	-10

6. Impacts of QHTBs' Activities on External Companies

Table 14 summarizes impacts of the QHTBs' business activities on external companies in Hawaii in 2015. Five QHTBs, 42%, reported that they had independent contractor expenses in 2015. The five QHTBs spent a total of $1.6 million to hire 52 contractors or external services for services performed in Hawaii. Among those, 69% ($1.1 million) was spent in the area of "Scientific and Technical Contract Services".

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 2015.

Table 14. Impacts of QHTBs' activities on external companies in Hawaii in 2015

Independent contractor expenses incurred by the QHTBs	$1,566,619
Total number of independent contractors hired/external services procured by the QHTBs	52
Number of new companies established in Hawaii to commercialize the QHTBs' intellectual property	0

7. Tax Credit Claimed with the State Department of Taxation

According to the State Department of Taxation (DoTax), fifteen claims (including corporations and individuals) were processed as of July 29, 2016 for the state research tax credit for tax year 2015. The total amount of the fifteen claims was $390,000.

The number of claims for the tax credit may be greater than the number of surveys completed with DBEDT by the QHTBs because of the pass-through taxation. If a QHTB is a partnership or other pass-through entity, the tax credits earned by the QHTB are passed through to its individual members, who claim the tax credits on their tax returns.

Timing differences may explain some of the discrepancy between the amount reported on the DBEDT surveys and DoTax tax credit claims. The surveys completed by QHTBs this year were due June 30, 2016. If a taxpayer is an individual or corporation with a tax year same as the calendar year, the tax return for tax year 2015 was due April 20, 2016. However, the due date may be extended to October 20, 2016 if the taxpayer requests an automatic extension. Thus, the claims processed by DoTax until July 2016 likely represent only a part of the total claims that will be filed for tax year 2015. Also, it takes time to process the tax returns.

Tax credit claims data available now for tax year 2013 and 2014 may be considered as total claims for the tax years. As per the Tax Credit study by DoTax for tax year 2013, the research tax credit was claimed on twenty five tax returns (12 corporations and 13 individuals) for tax year 2013 and the amounts claimed totaled $1.3 million. By comparison, ten QHTBs submitted the DBEDT research tax credit survey reporting total amount of tax credits of $1.1 million for the same tax year.

The number of QHTBs that submitted the survey with DBEDT for tax year 2014 and total amount of tax credit reported in the survey were not much higher than those for tax year 2013. Thirteen QHTBs submitted the DBEDT survey reporting total amount of $1.3 million for the research tax credit for tax year 2014. According to the preliminary figure as of August 22, 2016 from DoTax, however, there were sixty nine claims (20 corporations and 49 individuals) for the state research tax credit for tax year 2014. Total amount of the sixty nine claims was $2.9 million, more than twice of the amount reported in the survey with DBEDT for the tax year.

Appendix

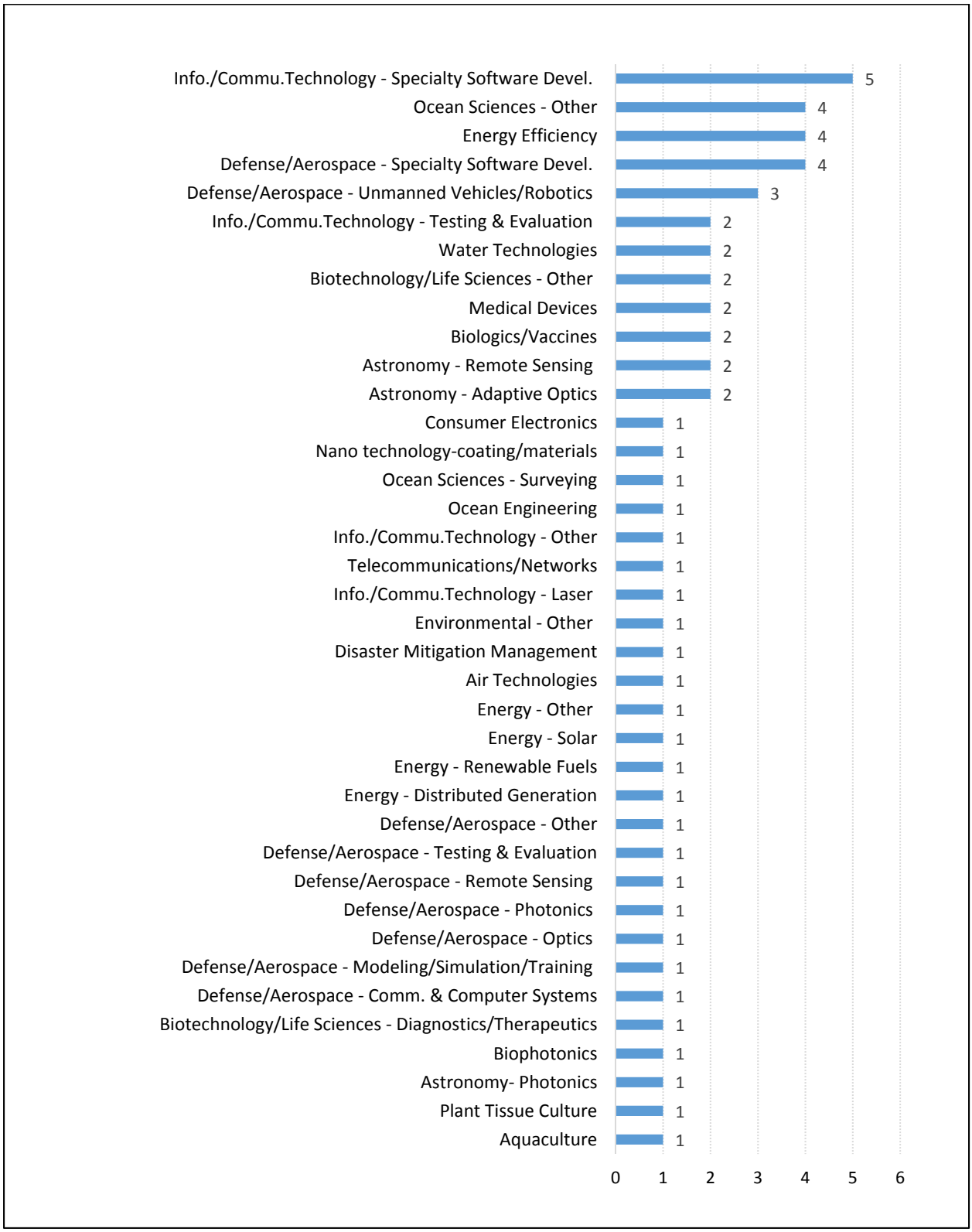
Table A- 1. List of QHTBs that completed Hawaii TCRA survey

Company name	Business Location	Tax Year		
		2015	2014	2013
Advanced Integrated Photonics INC.	Culver City, California			o
Alternative Energy Technologies, LLC	Honolulu, Honolulu County			o
Computer Software Associates, INC.	Kihei, Maui County	o		
DataHouse Consulting, INC.	Honolulu, Honolulu County			o
Douglas W Toomey	Hilo, Hawaii County	o		
Innovasc LLC	Honolulu, Honolulu County	o	o	
Kamakura Corporation	Honolulu, Honolulu County			o
Kuehnle AgroSystems INC.	Honolulu, Honolulu County	o	o	
Laulima Systems LLC	Kalaheo, Kauai County		o	
Makai Ocean Engineering, INC.	Waimanalo, Honolulu County	o	o	o
Navatek CFD Technologies, LLC	Honolulu, Honolulu County	o	o	
Navatek Lifting Body Technologies, LLC	Honolulu, Honolulu County	o	o	
Navatek LTD	Honolulu, Honolulu County	o	o	
Oceanit Laboratories, INC.	Honolulu, Honolulu County	o	o	o
Resurgo, LLC	Honolulu, Honolulu County		o	
Spirent Communications Hawaii LLC	Honolulu, Honolulu County	o	o	o
TeraSys Technologies LLC	Honolulu, Honolulu County		o	o
Tissue Genesis Institute, LLC	Honolulu, Honolulu County		o	o
Tissue Genesis, INC.	Honolulu, Honolulu County		o	o
Tritium Enterprises LLC	Kailua, Honolulu County	o		
Velocitek INC.	Paia, Maui County	o		

Table A- 2. Business areas of QHTBs in 2015, by detailed activity

(A QHTB is counted multiple times if it conducted business in multiple areas)

Industry sector	**Subsector**	**No. of QHTBs conduced business in the subsector**
Agricultural Biotechnology	Aquaculture	1
	Plant Tissue Culture	1
Astronomy	Adaptive Optics	2
	Photonics	1
	Remote Sensing	2
Biotechnology/Life Sciences	Bioinformatics/Biophotonics	1
	Biologics/Vaccines	2
	Diagnostics/Therapeutics	1
	Medical Devices	2
	Other	2
Defense/Aerospace	Communications & Computer Systems	1
	Modeling/Simulation/Training	1
	Optics	1
	Photonics	1
	Remote Sensing	1
	Specialty Software Development	4
	Testing & Evaluation	1
	Unmanned Vehicles/Robotics	3
	Other	2
Energy	Distributed Generation	1
	Energy Efficiency	4
	Renewable Fuels	1
	Solar	1
	Other	1
Environmental	Air Technologies	1
	Disaster Mitigation Management	1
	Water Technologies	2
	Other	1
Information/Communication Technology	Laser	1
	Specialty Software Development	5
	Telecommunications/Networks	1
	Testing & Evaluation	2
	Other	1
Ocean Sciences	Ocean Engineering	1
	Surveying	1
	Other	4
Other	Consumer Electronics	1
	Nano Technology-Coating/Materials	1

Figure A-1. Number of QHTBs that conducted business in each subsector

(A QHTB is counted multiple times if it conducted business in multiple areas)