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DEPT. COMM. NO. 378

August 25, 2017

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

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

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

For your information and consideration, I am transmitting a copy of the *Report on Hawaii Tax Credit for Research Activities for Tax Year 2016*, as required by Act 270, Hawaii Revised Statutes, 2013. In accordance with Section 93-16, Hawaii Revised Statutes, I am also informing you that the report may be viewed electronically at: http://files.hawaii.gov/dbedt/economic/data_reports/HawaiiResearchTaxCredit_TaxYear2016.pdf

Sincerely,

Luis P. Salaveria

Enclosure

c: Legislative Reference Bureau

Report on

Hawaii Tax Credit for Research Activities

for Tax Year 2016

August 2017

Department of Business, Economic Development and Tourism

State of Hawaii

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

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Executive Summary

- A total of eleven 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 2016. The eleven QHTBs reported that they spent an aggregate amount of $23.1 million in research activities in Hawaii in 2016. Among those, $20.0 million (86.5 %) was eligible for the research tax credit, and a total of $1.3 million was claimed or to be claimed for the research tax credit in State of Hawaii tax form N346.

- All eleven QHTBs were established before 2010 and have been undertaking the research activities for at least seven years.

- A total of 105 patents were owned or filed by seven QHTBs as of December 2016 (62: owned, 43 pending). Four QHTBs had no patents owned or filed as of December, 2016.

- "Ocean Science" was the most prevalent business sector with seven QHTBs (63.6%) doing business in the sector. "Defense and Aerospace" was another popular industry sector with five QHTBs doing business in the sector. The next were "Energy" and "Information & Communication Technology," sectors holding four QHTBs each.

- In 2016, the eleven QHTBs made a total of $67.3 million revenue from all goods and services produced in Hawaii, of which 49.6% ($33.4 million) was derived from out-of-state sales or activities. About 61% of total revenue was earned from intellectual properties that QHTBs produced in Hawaii.

- The eleven QHTBs spent $45.8 million in 2016 as operating expenses or capital expenditures for sales and activities performed in Hawaii, of which 32.2% ($15.0 million) was incurred in the "Defense and Aerospace" sector.

- As of December 2016, the eleven QHTBs had a total of 330 regular employees (307 full-time and 23 part-time employees) altogether. About three of the four regular employees, or 76.4%, were employed for research activities.

- More than three out of four full-time employees in the QHTBs got paid over $60,000 annually. About half of them paid over $100,000 annually.

- Despite of the incremental research activities expected for the QHTBs, almost all QHTBs that completed the survey with DBEDT experienced a job loss between 2015 and 2016. All of the job loss occurred in full-time research positions.

- Five QHTBs, 45%, reported that they had independent contractor expenses in 2016. The five QHTBs spent a total of $2.1 million to hire 63 contractors or external services for services performed in Hawaii in 2016.

- According to the State Department of Taxation, nine claims (including corporations and individuals) were processed as of July 31, 2017 for the state research tax credit for tax year 2016. The total amount of the nine claims was $685,828.

- Data for total tax credits claimed with the State Department of Taxation are now available for tax year 2013, 2014, and 2015[1]. In comparison with the credit amount reported in the survey with DBEDT, the credit amount claimed with the Department of Taxation were more than twice as much for tax year 2014 and 2015. It suggests the possibility that not all businesses who claimed the tax credit completed the survey with DBEDT.

[1] Data from Hawaii Department of Taxation for tax year 2015 are preliminary.

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

	2016 tax year	2015 tax year	2014 tax year	2013 tax year
No. of QHTB submitted TCRA survey	11 [1]	12	13	10
Total Tax credit claimed for Hawaii TCRA	$1.3M	$1.1M	$1.3 M	$1.1 M
Total Research expense incurred in Hawaii	$23.1M	$20.1M	$28.1 M	$25.7 M
Avg. Tax credit claimed for Hawaii TCRA per QHTB	$122K	$89K	$100 K	$109 K
Popular areas of research [2] (number of QHTBs)	Computer Software(8) Non-fossil fuel(5) Ocean science(5)	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)
Business/Revenue/Expense				
Popular areas of businesses [2](number of QHTBs)	Ocean science(7) Defense/Aerospace(5) Energy(4) Infor./Comm. Tech(4)	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)
Total number of patents owned or filed	105	116	158	107
Avg. Revenue per QHTB	$6.1M	$3.9M	$4.0 M	$5.4 M
% of revenue from out of state sale	49.6%	70.3%	65.2%	66.2%
% of revenue from intellectual property	61.3%	32.5%	23.4%	30%
Avg. Operating expenses per QHTB	$4.2M	$3.2M	$3.4 M	$4.3 M
Avg. Capital expenditure per QHTB [3]	$75K	$59K	$26 K	$247 K
Employment [4]				
Total number of employees	330	270	297	338
Avg. number of employees per QHTB	30.0	22.5	22.8	33.8
Research jobs as % of total jobs	76.9%	72.6%	78.5%	77.2%
Full time jobs as % of total jobs	93.0%	91.1%	86.9%	82.8%
% of jobs with wage $60K or higher	74.2%	76.3%	78.5%	71.7%
% of jobs with wage $100K or higher	34.2%	41.5%	39.4%	31.7%
Change in total jobs from last year	-25 (-7.0%)	-14 (-4.9%)	18 (6.5%)	-20 (-6.0%)
Change in research jobs from last year	-25 (-9.0%)	-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 2015.
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 fourth report that is prepared pursuant to Act 270. This report includes statistics on various activities of QHTBs that completed the research activity tax credit survey with DBEDT for their taxable year 2016. Most statistics reported in this report are for activities undertaken in calendar year 2016.

2. Characteristics of QHTBs

For tax year 2016, a total of eleven QHTBs completed the survey with DBEDT on the Hawaii tax credit for research activities. QHTBs in this report refer to the eleven companies unless otherwise stated.

Age of QHTBs

All QHTBs that submitted the Hawaii research tax credit survey for tax year 2016 have been doing business for many years as all of them were established before 2010. Five QHTBs were established before 2000 whereas six QHTBs were established between 2000 and 2010.

Table 1. QHTBs by year established

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

History of research activity was also long. All eleven QHTBs reported that they had been undertaking the research activities for at least seven years.

Table 2. History of research activities

Years	Less than 7 years	7 years or longer
No. of QHTBs	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, 2016, a total of 62 patents were owned by the QHTBs while another 43 patents were filed and pending. However, not all QHTBs owned or have filed patents. Among the eleven QHTBs, four QHTBs had no patent owned or filed as of December 31, 2016.

Table 3. Patents owned or filed by QHTBs (as of Dec 31, 2016)

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		
105	62	43	7 out of 11	2 out of 11

Ten QHTBs (91%) reported that they owned intellectual property other than patents. All QHTBs with patents also owned intellectual properties other than patents. Among the four QHTBs that had no patent owned or filed, three QHTBs reported that they owned other intellectual properties.

Table 4. Other intellectual property owned by QHTBs (as of Dec 31, 2016)

Total number of QHTBs that submitted tax credit surveys	No. of QHTBs with other intellectual property			
	Copyrights	Trade Secrets	Licenses	Trademarks
11	4	4	6	9

Business sector of QHTBs

The survey asked each QHTB to indicate all industry sectors in which the QHTB conducted business in 2016. Eight major business sectors consisting of eighty four subsectors were provided in the survey as business categories. Four QHTBs (36%) 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.

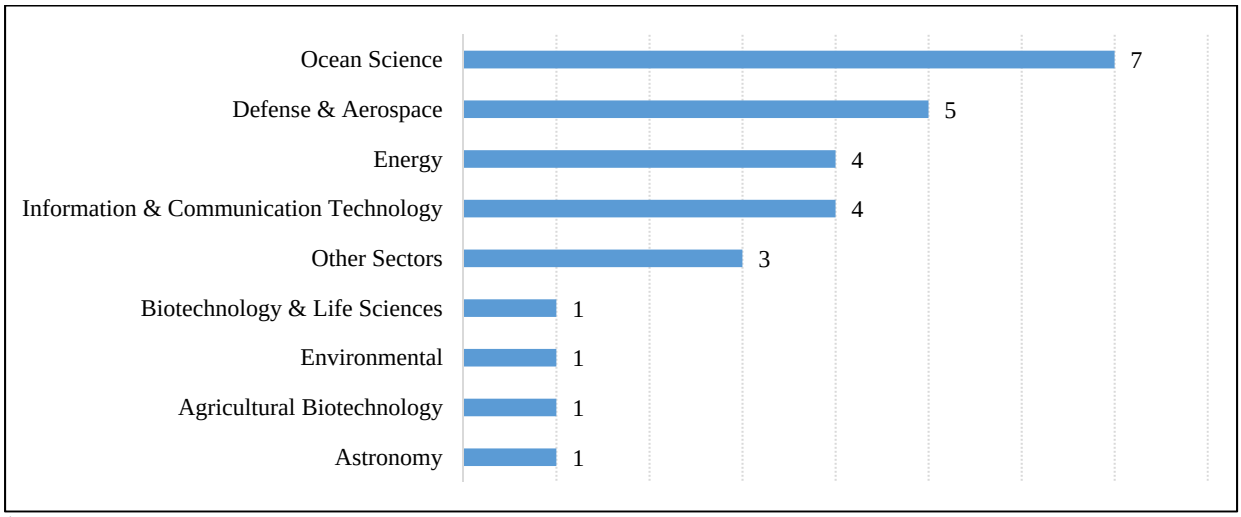
Table 5. Business areas of QHTBs in 2016 (number of QHTBs)

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

Figure 1 shows total number of QHTBs that conducted business in each industry sector in 2016, counting the multi-sector companies multiple times for all industry sectors they did business in.

"Ocean Science" sector hosted the largest number of companies. Seven QHTBs (64%) indicated that they did business in this sector. "Defense and Aerospace" was another popular industry sector with five QHTBs doing business in the sector. The next were "Energy" and "Information & Communication Technology," sectors 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 "Defense and Aerospace" sector was the most prevalent business activity amongst the QHTBs in 2016.

3. Revenue and Spending Structure

Revenue structure of QHTBs

In 2016, the eleven QHTBs made a total of $67.3 million revenue from all goods and services produced in Hawaii, of which 49.6% ($33.4 million) was derived from out-of state sales or activities.

About 61% of total revenue was earned from intellectual properties that QHTBs produced in Hawaii. The combined revenue of the eleven QHTBs from their intellectual properties, by selling patented products or licensing royalty, etc., was $41.3 million in 2016. 33.2% ($13.7 million) of the revenue from the intellectual properties was earned from out-of-state sales.

Table 6. Revenues of QHTBs, by revenue source

Source of revenue	Revenue in 2016	
Total revenue	$67,342,090	100%
- from out-of-state sales	$33,381,279	49.6%
Revenue from intellectual property	$41,295,135	100%
- from out-of-state sales	$13,726,860	33.2%

Hawaii expenses of QHTBs

The eleven QHTBs spent $46.7 million in 2016 as operating expenses or capital expenditures for sales and activities performed in Hawaii.

Table 7. Operating and Capital expenditure spent by QHTBs in 2016

Operating Expenses spent by QHTBs	Capital Expenditures spent by QHTBs
$45,847,817	$825,842

Table 8 presents where QHTBs made the spending in 2016 by industry sector. 32.2% ($15.0 million) of the QHTBs' Hawaii expenses was incurred in "Defense and Aerospace" while another 26.1% ($12.2 million) of the spending was incurred in the "Biotechnology and Life Sciences" sector.

A subsector that received the largest QHTBs' spending in 2016 was Contract Research Organization subsector in "Biotechnology & Life Sciences". $11.3 million spending was made in this subsector in 2016. Other subsectors that received a large expenditure include Specialty Software Development subsector in "Defense & Aerospace" ($8.6 million), Content Development in "Film/Digital Media" ($7.7 million), Modeling/Simulation/Training in "Defense/Aerospace" ($4.9 million), and Ocean Engineering in "Ocean Sciences" ($4.9 million).

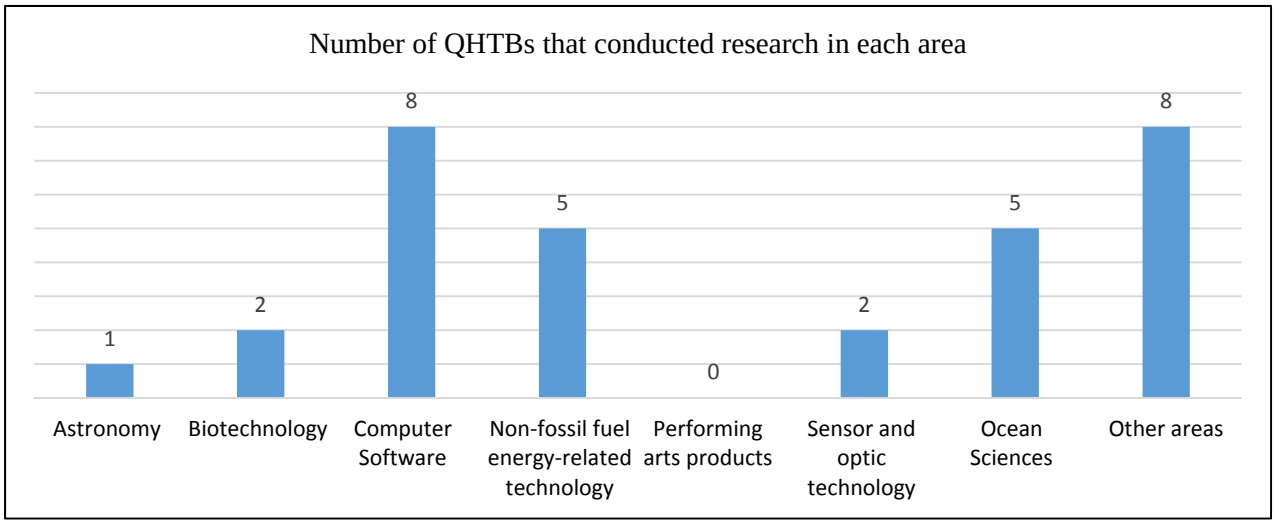
Table 8. Where QHTBs spent their operating and capital expenditures in 2016

All sectors	**$46,673,659**	**100.0%**
Defense/Aerospace	**$15,027,529**	**32.2%**
- Specialty Software Development	$8,594,462	18.4%
- Modeling/Simulation/Training	$4,891,994	10.5%
- Remote Sensing	$1,370,919	2.9%
- Communications & Computer Systems	$170,155	0.4%
Biotechnology/Life Sciences	**$12,186,147**	**26.1%**
- Contract Research Organization	$11,301,821	24.2%
- Other	$884,326	1.9%
Film/Digital Media	**$7,844,203**	**16.8%**
- Content Development	$7,666,958	16.4%
- Mobile Technologies	$177,245	0.4%
Ocean Sciences	**$7,478,710**	**16.0%**
- Ocean Engineering	$4,883,152	10.5%
- Other	$2,586,150	5.5%
- Marine Biotechnology	$9,408	0.0%
Information/Communication Technology	**$1,101,977**	**2.4%**
- Specialty Software Development	$1,101,977	2.4%
Energy	**$578,561**	**1.2%**
- Energy Efficiency	$571,472	1.2%
- Solar	$7,090	0.0%
Environmental	**$415,430**	**0.9%**
- Disaster Mitigation Management	$415,430	0.9%
Agricultural Biotechnology	**$37,631**	**0.1%**
- Plant Tissue Culture	$37,631	0.1%
Unidentified	$2,003,471	4.3%

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 eleven QHTBs, seven 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 2016. Other research area that were popular among the eleven QHTBs includes "Non-Fossil Fuel Energy Related Technology" and "Ocean Sciences". Five QHTBs conducted research in each of the areas in 2016.

Figure 2. Areas where QHTBs conducted research in 2016



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 eleven QHTBs who completed the Hawaii research credit survey for tax year 2016 reported that they spent an aggregate amount of $23.1 million in research activities in Hawaii in 2016. Among those, $20.0 million (86.5%) was eligible for the Hawaii tax credit for research activities

(TCRA), and a total of $1.3 million was claimed or to be claimed by the eleven QHTBs for tax credit on Form N346.

The amount that individual QHTB claimed for the Hawaii research tax credit ranged from $5,000 to $410,000. Three QHTBs reported that they claimed more than $200,000 for the research credit on Form N346 for tax year 2016. All eleven QHTBs reported that they paid zero corporate income tax for tax year 2016.

Table 9. Reported research expenses and tax credit for tax year 2016

Total Research Expenses occurred in Hawaii	Total Research Expenses eligible for Hawaii TCRA	Total Tax Credit reported for Hawaii TCRA
$23,145,396 100%	$20,019,570 86.5%	$1,344,717

5. Job Characteristics and Creation

Employment overview

As of December 12, 2016, the eleven QHTBs had a total of 330 regular employees (307 full-time and 23 part-time employees). About three of the four regular employees, or 76.4%, were employed for research activities. The share of research activity jobs was a little higher in full-time jobs than in part-time jobs.

A total of 16 workers were employed on a temporary or seasonal basis by the QHTBs during the calendar year 2016. Out of the 16 temporarily or seasonally hired workers, 13 workers (81.3%) were employed to work on research activities.

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

	As of December 2016			Temporary / Seasonal in 2016
	Total	Full-time	Part-time	
All areas	330	307	23	16
In research activities	252	236	16	13
Research activity jobs as % of total jobs	76.4%	76.9%	69.6%	81.3%

Employment size

QHTBs that completed the research tax credit survey for tax year 2016 varied substantially in employment size. The number of regular employees that each of the QHTBs had as of December 2016 ranged from as low as 1 to 86. Four QHTBs had 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 2016)	**No. of QHTBs**
1-5	3
6-9	1
10-24	2
25-49	2
50-75	1
75-100	2

[1] Excludes temporary and seasonal employees

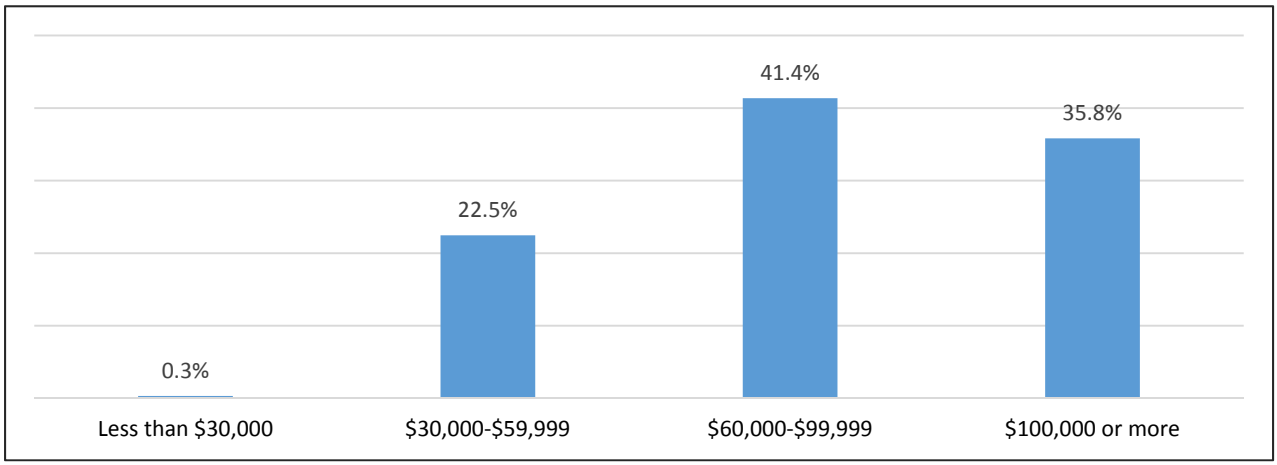
Compensation levels of jobs in QHTBs

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

Table 12. Full-time and part-time employees in 2016 by wage level

Annual wage	Full & Part-time		Full-time		Part-time	
	Jobs	Percentages	Jobs	Percentages	Jobs	Percentages
Less than $30,000	8	2.4%	1	0.3%	7	30.4%
$30,000-$59,999	77	23.3%	69	22.5%	8	34.8%
$60,000-$99,999	132	40.0%	127	41.4%	5	21.7%
$100,000 or more	113	34.2%	110	35.8%	3	13.0%
Total	330	100%	307	100%	23	100%

Figure 3. Full- time employees of QHTBs in 2016 by wage level



Job changes in QHTBs from the previous year

Despite of the incremental research activities expected for the QHTBs, almost all QHTBs that completed the survey with DBEDT for tax year 2016 experienced a job loss between 2015 and 2016. Ten out of the eleven QHTBs lost jobs in 2016. Moreover, all of the job loss occurred in full-time research positions. In December 2016, the aggregate number of full-time research jobs in the ten QHTBs was 9.9% lower than they offered a year ago. The job growth in the remaining one QHTB was also very minimal with only one additional job in 2016 compared to 2015.

Table 13. Employment changes in QHTBs from 2015 to 2016

Employees		2016	2015	Changes from 2015
Full-time &Part-time	In all areas	330	355	-25
	In research activities	252	277	-25
Full-time	In all areas	307	333	-26
	In research activities	236	262	-26
Part-time	In all areas	23	22	1
	In research activities	16	15	1

6. Impacts of QHTBs' Activities on External Companies

Table 14 summarizes impacts of the QHTBs' business activities on external companies in Hawaii in 2016. Five QHTBs, 45%, reported that they had independent contractor expenses in 2016. The five QHTBs spent a total of $2.1 million to hire 63 contractors or external services for services performed in Hawaii. Among those, 83% ($1.8 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 2016.

Table 14. Impacts of QHTBs' activities on external companies in Hawaii in 2016

Independent contractor expenses incurred by the QHTBs	$2,124,694
Total number of independent contractors hired/external services procured by the QHTBs	63
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, nine claims (including corporations and individuals) were processed as of July 31, 2017 for the state research tax credit for tax year 2016. The total amount of the nine claims was $685,828.

The number and amount reported in the DBEDT survey and the tax credit claims processed by the Department of Taxation are not directly comparable for two reasons. First, 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. The second cause of the discrepancy is timing differences. The surveys completed by QHTBs this year were due June 30, 2017. If a taxpayer is an individual or corporation with a tax year same as the calendar year, the tax return for tax year 2016 was due April 20, 2017. However, the due date may be extended to October 20, 2017 if the taxpayer requests an automatic extension. Thus, the claims processed until July 2017 likely represent only a part of the total claims that will be filed for tax year 2016.

Meanwhile, data for total tax credits claimed with the State Department of Taxation are now available for tax year 2013, 2014, and 2015. Compared with the credit amount reported in the survey with DBEDT, the credit amount claimed with the Department of Taxation were more than twice as much for tax year 2014 and 2015. It suggests the possibility that not all businesses who claimed the tax credit completed the survey with DBEDT.

Table 15. Research Activity Tax Credits Claimed with the Department of Taxation

Tax Year	Claimed with Department of Taxation [1]				Reported in the survey with DBEDT	
	# of Claims			Credit Amount	# of QHTBs who completed the survey	Credit Amount
	All	Individuals	Corporations			
2013	25	13	12	$1.3 M	10	$1.1 M
2014	69	49	20	$2.9 M	13	$1.3 M
2015	57 [2]	33 [2]	24 [2]	$2.9 M [2]	12	$1.1 M

[1] Tax Credits Claimed by Hawaii Taxpayers, Tax Year 2013, 2014, Hawaii Department of Taxation
[2] Preliminary number

Appendix

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

Company name	Business Location	Tax Year			
		2016	2015	2014	2013
Architects Hawaii LLC	Honolulu, Honolulu County	o			
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	o	
Laulima Systems LLC	Kalaheo, Kauai County			o	
Makai Ocean Engineering, INC.	Waimanalo, Honolulu County	o	o	o	o
Navatek Alternative Energy Technologies	Honolulu, Honolulu County	o			
Navatek CFD Technologies, LLC	Honolulu, Honolulu County	o	o	o	
Navatek Lifting Body Technologies, LLC	Honolulu, Honolulu County	o	o	o	
Navatek LTD	Honolulu, Honolulu County	o	o	o	
Oceanit Laboratories, INC.	Honolulu, Honolulu County	o	o	o	o
Quantify IP	Honolulu, Honolulu County	o			
Resurgo, LLC	Honolulu, Honolulu County			o	
Spirent Communications Hawaii LLC	Honolulu, Honolulu County	o	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	o		

Table A- 2. Business areas of QHTBs in 2016, 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	1
	Remote Sensing	1
Biotechnology/Life Sciences	Life Sciences: Biologics/Vaccines	1
	Life Sciences: Diagnostics/Therapeutics	1
	Life Sciences: Other	1
Defense/Aerospace	Communications & Computer Systems	1
	Modeling/Simulation/Training	2
	Optics	1
	Photonics	1
	Remote Sensing	1
	Specialty Software Development	5
	Testing & Evaluation	1
	Unmanned Vehicles/Robotics	4
	Other	1
Energy	Energy Efficiency	3
	Renewable Fuels	1
Environmental	Air Technologies	1
	Disaster Mitigation Management	1
	Water Technologies	1
	Other	1
Information/Communication Technology	Technology: Information Services	1
	Modeling/Simulation/Training	1
	Specialty Software Development	4
	Telecommunications/Networks	1
	Testing & Evaluation	2
	Other	1
Ocean Sciences	Marine Biotechnology	2
	Ocean Engineering	1
	Other	4
Other	Architecture, Interior design	1
	Nano technology-coating/materials	1
	Consumer Electronics	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)