



## YEARLY ACTIVITY PLAN (YAP) - FY '08

**Division/Attached Agency:** Strategic Industries Division

**Program Name:** Science & Technology Branch

**Program ID:** BED 120

### I. PROGRAM PLANNING

**Problem, issue or opportunity statement:** Describe the problem(s), issue(s) and/or opportunity(ies) your program is attempting to respond to. Identify the participants (individuals, companies, industry sectors, etc.) engaged in this problem, issue and/or opportunity.

The problem, issue or opportunity statement remains basically the same as it was in FY 07, with a new emphasis on the importance of educating and building a workforce to meet the State's economic development objectives. The need to diversify Hawaii's economy by focusing economic development efforts on industries that do not rely on land and natural resources for sustainable growth was emphasized by Governor Lingle's Innovation Initiative, introduced to the 2007 Legislature. That initiative recognized the accelerating need to compete in the global economy. A key strategy is to direct more attention to expanding and diversifying Hawaii's science & technology (S&T) sectors, including preparing Hawaii's workforce to fill the expanding demand for highly skilled employees in these sectors, as well as tech-related jobs in all sectors of the economy. The foundation of creating this workforce is improving the State's ability to deliver a quality education in science, technology, engineering, and math (STEM). In order to grow significantly, Hawaii's science & technology-based companies also need to develop new export markets. In order for the industry to grow by adding more companies, the commercialization of scientific innovation needs to be accelerated and Hawaii's non-tech image (sun, sand & surf) needs to be broadened to include science & technology. Our primary customers (participants) are local science & technology companies and academic research institutions, primarily in ocean science & technology, aerospace, and life sciences (directories of these organizations are available). Our target audience includes federal fund managers, potential investors and purchasers of goods and services, and science & technology media (local, national and international).

**Need and partners:** Specify the need for government intervention. Provide supporting evidence. Identify any partners you will be working with to address the problem, issue and/or opportunity.

Last year, six major areas of program activity were identified: export assistance; communications/networking; industry advocacy; UH-Industry partnerships/workforce development; major project coordination; and industry analysis. For FY 08, three of these areas will continue to be addressed. In addition, a new focus area on STEM education will be added.

1. Export Assistance: Most Hawaii science & technology-based companies are small, with limited marketing budgets or expertise. Several companies have been successful at attracting defense and other federal funding, both competitive and earmarked, but there is a need to develop other markets on a national and global scale. For some companies, participation in our programs is their first introduction to trade shows, with highly qualified and concentrated audiences, as part of their marketing strategy. Without State assistance (financial and technical) they would not be willing to explore potential new markets. Partners include: DBEDT Strategic Marketing & Support Division (SMSD), Economic Development Boards (EDBs), University of Hawaii (UH), and private sector including the Hawaii Science & Technology Council (HSTC).
2. Communications/networking: Hawaii continues to suffer from a resort destination image in the minds of many funding agencies and potential investors, partners and purchasers of products and services. Although we believe that progress is being made, there is still a long way to go before Hawaii is generally regarded as a science & technology leader. It is beyond the scope of any one company or

Note: This form was created using the *W. K. Kellogg Foundation Logic Model Development Guide, January 2004.*

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the University of Hawaii to raise awareness of Hawaii's achievements, capabilities, resources and infrastructure. There is a need for a concerted effort to change the image by publicizing Hawaii's achievements and creating awareness of Hawaii's natural resources, infrastructure and personnel assets. This is a traditional role of government in tech-based economic development programs. Partners include: SMSD, High Technology Development Corporations (HTDC), Natural Energy Laboratory of Hawaii Authority (NELHA), EDBs, UH, private sector including HSTC, Hawaii Visitors Bureau (HVCB), and Hawaii Convention Center (HCC).

3. UH-Industry Partnerships/Workforce Development: Successful efforts to grow an economy based on technological and scientific achievement in other regions have all included strong ties to academic research institutions as a source of intellectual capital, innovation, and technical skills. Several states have developed models that closely tie academic policies to economic development objectives through a cooperative effort by government, industry and academia. There is a need for government, through its economic development agency, to promote UH-industry partnerships to facilitate tech transfer and the development of a skilled workforce that can support the S&T industry. Partners include: UH, private industry.
4. STEM Education: National recognition that the US has fallen behind many other countries in its ability to educate sufficient engineers and other highly trained workers to remain competitive in today's global marketplace was articulated in the 2006 report "Rising Above the Gathering Storm" and other recent publications. During FY 07, understanding of this critical need for improved STEM education was a key component of the Governor's Innovation Initiative, spearheaded by DBEDT. The Innovation in Education bill contained seven proposals to improve Hawaii's ability to deliver a quality STEM education. While education is a key responsibility of State government, through the Department of Education (DOE), there is also a compelling need for DBEDT, as the economic development agency, to help insure that the education system can produce a workforce capable of supporting the economic development objectives of the State. Partners include: DOE, UH (including Community Colleges, College of Engineering, and College of Education), Workforce Development Council, private sector.

**Desired results (outputs, outcomes and impacts):** Identify desired results, what success will look like, by describing what you expect to achieve near (0-2 years) and long-term (2-6 years).

Near-term

1. S&T exports have been increased by working with partners to develop a more robust trade show/trade mission program, with increased private sector participation.
2. Hawaii's S&T image has been enhanced by building a stronger communication program and becoming a point source for technical information and referrals.
3. A stronger collaboration between UH and industry has been established by implementing the Experimental Program to Stimulate Competitive Research (EPSCoR) contract on workforce development, working with the office of the VP for Research on specific program areas, and supporting efforts of the Office of Technology Transfer and Economic Development (OTTED) to facilitate UH-industry partnerships and accelerate tech transfer.
4. Programs have been established to implement the provisions of Act 111, SLH 2007: FIRST and HiEST Academies, professional development in STEM, attraction of new STEM teachers, and increased industry internship/mentorship opportunities. Additional best-practices programs (those not passed by Act 111 and new proposals) are adopted and funded.

Long-term

1. S&T exports show steady increases and expanded employment through expansion and retention of existing companies, new company formation and attraction of new investment.
2. Hawaii is recognized as a leader in a number of S&T niches and a center of innovation in the Pacific.
3. UH and industry have built a strong, mutually rewarding relationship with emphasis on key focal areas of competitive strength.
4. The FIRST and HiEST Academies, professional development, teacher attraction incentives and

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internship/mentorship programs have been institutionalized in the State's base budget to insure long-term funding commitments. The two programs not established by Act 111 (STEM scholarships and a matching program to fund STEM endowed chairs) have been funded. The first STEM academy graduates have entered UH and other Hawaii institutions of higher education in STEM fields and we are able to track their progress through a formal process.

**Influential Factors:** List the factors you believe will influence your ability to impact the problem or opportunity. (Things that support success and barriers to success.)

Support

- Innovation Initiative has focused more administrative, legislative and community attention on importance of S&T industry sectors.
- Increasing cooperation among organizations with a focus on tech-based economic development.
- Growing commitment of UH to increasing their role in supporting the State's economic development objectives.
- More sources of capital are available to create spin-off companies, generating new products and services.

Barriers

- Increased competition. Many states have initiated economic development strategies based on science & technology. With Hawaii's smaller population base, we have fewer dollars to spend to compete with these other regions in raising awareness of opportunities in Hawaii.
- The "Not in My Backyard" attitude and public concerns about safety, health, and other issues. Examples include genetically engineered crops and other organisms, bioprospecting, the building of a regional biosafety laboratory, additional telescopes on Mauna Kea, etc.
- Internally, the struggle to rebuild capacity (fill vacancies, replace reduced funding) limits the effectiveness of the program.

**Strategies:** List the general successful strategies or "best practices" that have helped other programs achieve the kind of results your program promises.

1. Focus on niche opportunity sectors where Hawaii has recognized advantages based on resources, expertise and infrastructure.
2. Focus on activities where government can address a significant need that is not being met by industry.
3. Focus on supporting strong university-industry partnerships to facilitate workforce development and tech transfer.
4. Focus on policy development that supports science & technology.
5. Focus on developing a well-informed and supportive local community.
6. Focus on expanding Hawaii's sun, sand and surf image to include science and technology.
7. Focus on pursuing opportunities to improve Hawaii's STEM education.
8. Focus on building partnerships with private sector economic development agencies, the Hawaii Science & Technology Council, and other state and county agencies.

**Assumptions:** State the assumptions behind *how* and *why* the change strategies you have identified will work.

1. Local science & technology companies are maturing and progressing from R&D to commercialization. More companies are gradually being formed or attracted, deepening the sector base and developing toward a critical mass.
2. Local success stories, both in the private sector and at UH, are compelling and if given broader dissemination through a strong communications program will help shift Hawaii's image.
3. The University of Hawaii is recognizing and beginning to embrace its role as an economic catalyst to a greater extent.
4. The Innovation Initiative elevated the awareness of the importance of STEM education to a new level and brought new energy to the efforts to build a stronger coalition of educators, government agencies, and business leaders committed to building a more productive and competitive workforce through improved STEM education.

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**II. PROGRAM IMPLEMENTATION**

**Resources:** Describe the resources or influential factors available to support your program.

A reduced staffing level continues to influence our ability to fully address all components of the program. Efforts to fill two Economic Development Specialists were not successful during FY 07. Recruitment efforts will be a primary focus in FY 08. Funding for core program activities is about \$150,000. In addition, DBEDT will be managing new funds as a result of the Innovation Initiative. A Memorandum of Agreement with the Department of Human Services will fund additional STEM HiEST Academies (beyond Act 111) and the State has received a two-year \$500,000 grant from the National Governors Association (NGA) to provide supportive systems for the STEM Academies. The EPSCoR contract with the UH will be supplemented by \$110,000 from Act 111 to strengthen internships and other experiential programs. Success is also dependent upon maintaining current partnerships (SMSD, HTDC, UH, EDBs, HSTC, DOE, private sector, federal agencies) and building new relationships.

**Activities:** Describe each of the activities you plan to conduct within your program.

1. Export Assistance: Level the playing field by organizing State pavilions at selected trade shows, offering participants a turn-key opportunity that reduces their risk by lowering the required investment of both time and money. This also assists the University of Hawaii to meet their need to raise awareness of their research achievements and attract funding, faculty and students.
2. Communications/networking: Use a variety of communication tools, including: displays at trade shows; production of brochures and reports; presentations at conferences; advertisements, editorials and articles in trade journals; websites; attraction of conferences to Hawaii; coordination/cosponsorship of Hawaii conferences; and personal communication.
3. UH-Industry Partnerships/Workforce Development: Provide funds and work with UH to enhance a federal grant to increase UH competitiveness (EPSCoR) with an emphasis developing university-industry partnerships, student internships, and entrepreneurship activities statewide.
4. STEM Education: Work with DOE, UH, DHS and other stakeholders to facilitate implementation of the provisions of Act 111, the MOA with DHS and the NGA grant, expand relationships within the education community, identify and propose new initiatives to keep momentum going.

**Outputs:** For each program activity, identify what outputs you aim to produce

1. Export Assistance: Organization of Hawaii pavilions at three trade shows: SPIE 2007 (applied optics) and BIO 2008 (life sciences), both with SMSD, Oceans 2007. For OCEANS and BIO, development of new display material and revised brochures.
2. Communications/Networking: Complete overhaul of the Ocean S&T website to include all S&T, development & placement of Hawaii S&T video on airlines and for use at trade shows and other venues, publication of editorials and articles in trade journals, attraction of S&T conferences to Hawaii.
3. UH-Industry Partnerships/Workforce Development: Implementation of the contract with UH to manage State EPSCoR funds for workforce development. Continued collaboration with UH research units, OTTED and VP for Research on a variety of programs.
4. STEM Education: In conjunction with the STEM Team: completed plans for STEM academies , functioning internship/mentorship program, programs of the NGA grant in progress, new legislation.

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**Outcomes:** Identify the short-term (0-2 years) and long-term (2-6 years) outcomes you expect to achieve.

### Short-term

1. Export Assistance: Increased participation of companies in trade shows that are currently organized by DBEDT resulting in additional export activity. Target is a minimum of 10-15 new companies that project additional sales of \$2 million during the 12 months following the trade show.
2. Communications/Networking: 1) Increased exposure for Hawaii's S&T achievements through the website and in national and international trade publications resulting in increased S&T media interest. Target is at least one feature article in each industry sector. 2) Increased recognition of Hawaii as an S&T leader through hosting prestigious conferences that also generate tourism revenue. Target is a minimum of two to three conferences in the pipeline that are organized, cosponsored or attracted to Hawaii, generating \$0.5 - 1 million.
3. UH-Industry Partnerships/Workforce Development: Significant progress made in implementing UH contract for EPSCoR funding: workforce development, internships, entrepreneurship within UH. Target for this year is to get the programs established, with personnel hired (unsuccessful attempt in FY 07).
4. STEM Education: In conjunction with the STEM Team, FIRST Academy program implemented by UH College of Engineering, 10 HiEST Academies ready to enroll students in August 2008, other Act 111 programs implemented, Year 1 objectives of the NGA grant met, new STEM education proposals approved.

### Long-term

1. Export Assistance: Where appropriate, companies increase individual export efforts, either through exhibiting at specialized events or other export activities. As sectors mature, companies form marketing groups without State assistance and State identifies new sectors to energize. S&T contributes significantly to State economy.
2. Enhancing Hawaii's Image: Hawaii is recognized as a leader in specific S&T niches and as a successful state in building a tech-based economic pillar.
3. UH-Industry Partnerships/Workforce Development: Established R&D partnerships and a significant increase in technology transfer. Successful internship program established statewide.
4. STEM Education: STEM Academies are fully subscribed in every school that wants to participate; target is 4000 enrollments, 9<sup>th</sup> through 12<sup>th</sup> grades, based on 14 HiEST academies, and 16,000 6<sup>th</sup> to 10<sup>th</sup> graders involved in FIRST pre-academy programs, equal to 75% of students in complexes with HiEST academies. Most science and math teachers are trained and certified to teach in STEM subjects. Post-secondary remediation rates have decreased to less than 10% for HiEST grads. Science and math scores have begun to rise (this may take longer to show in the statistics). Percentage of Hawaii students seeking STEM degrees has increased; target is 20% of HiEST grads, with 75% of those obtaining STEM degrees entering STEM areas of work after graduation.

**Impact:** Describe the lasting impact you anticipate.

Hawaii's science and technology sectors contribute significantly to the State's economy through attraction of external investment and revenue, and increased employment opportunities in high-value jobs that attract and retain talent. Hawaii is recognized as a leader in certain S&T fields that have significant natural resource, infrastructure and personnel assets. S&T sectors are viewed locally as good investment opportunities and beneficial to the State as a whole. Hawaii students receive a high-quality STEM education that enables them to enter STEM careers, meeting the needs of our local industry, or apply critical thinking and S&T skills to all sectors of the economy. The result is a stronger, more productive and competitive economy that affords Hawaii's citizens a higher standard of living.



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**III. PROGRAM EVALUATION**

**Focus Area:** From your program logic model, list the components of the most important aspects of your program.

1. Direct export assistance to S&T industry.
2. Communication/networking.
3. UH/Industry partnership building.
4. STEM education support.

**Audience:** Identify the key audiences for each focus area. Who has an interest in your program?

1. Local S&T companies and nonprofit organizations, University of Hawaii & other research institutions.
2. Local public, local media, national and international S&T media, federal fund managers, investors, companies looking to locate in Hawaii.
3. University of Hawaii (administration and researchers), local and external S&T companies.
4. Local public, DOE, education stakeholders, employers (S&T companies & others needing tech support)

**Questions:** For each focus area and audience, list the questions they may have about your program.

1. What are the benefits of participating with DBEDT at trade shows? How can DBEDT help increase my exports?
2. What does Hawaii have to offer? Why is S&T good for Hawaii? Does Hawaii have a legitimate claim to leadership in any S&T areas? What are the benefits of investing in Hawaii S&T? What are the benefits of doing S&T business in Hawaii?
3. How can DBEDT facilitate interaction between UH and industry?
4. Why is DBEDT involved in education? How can developing the STEM pipeline improve education and the quality of life in Hawaii?

**Information Use:** For each audience and question you have identified, identify the ways you will use the evaluation information.

1. Provide feedback to companies on effectiveness of the trade show in meeting participant goals.
2. Publish information on size of S&T sectors, competitive advantages, achievements, and investment opportunities.
3. Work with UH to improve industry participation in programs.
4. Publish information on program interest, participation, and eventually results.

**Indicators:** Describe what information can be collected that would convey the status of your program.

As indicated last year, when staffing is completed, the Branch will carry out a strategic planning exercise. Part of that effort will include an examination of best practices for measuring achievement of tech-based economic development goals and objectives. For now, these are the types of information that we collect when possible. However, staffing shortages mean that priority is given to accomplishing primary tasks.

1. Number of participants in trade shows.
2. Number of qualified leads generated by trade shows and other activities.
3. Follow-up with participants (quantitative & qualitative)
4. Revenues & employment of targeted sectors (due to a combination of factors), where available
5. Website activity
6. External funding generated
7. Number & value of S&T conferences attracted to Hawaii.

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New indicators to assess progress on the STEM education initiatives will also be collected, as well as data that will be generated as part of the long-term assessment program funded by the NGA grant. Specific program measures will include"

1. Number of HiEST academies established & number of students enrolled
2. Number of schools participating in FIRST pre-academy programs, including robotics and RET & number of students reached
3. Number of new STEM teachers recruited as a result of Act 111 funding
4. Number of teachers receiving STEM training as a result of Act 111 funding
5. Number of internships and other experiential learning opportunities provided by combined EPSCoR/Act 111 funding.

**IV. ALIGNMENT**

How is your program linked to DBEDT's six strategic objectives?		
1.	<b>X</b>	Workforce Housing: a strengthened economy with a better educated workforce provides additional resources to support workforce housing and improves personal income, reducing the need
2.	<b>X</b>	Workforce Development: improved STEM education is critical to developing a workforce that can meet the needs of both our growing tech-based sectors and the traditional economic sectors that are made more productive through the use of technology
3.	<b>X</b>	"Energy For Tomorrow": reducing the State's reliance on petroleum requires developing and improving technologies to improve efficiency and economically utilize renewable sources
4.	<b>X</b>	"Global Links/Export of Goods and Services": Hawaii's S&T sector can only grow to become a significant contributor to the economy by exporting goods and services that are globally competitive and attracting investment from external sources
5.	<b>X</b>	The Creation Of An "Innovation Infrastructure": the Innovation in Education programs are a key component of the State's Innovation Initiative to create an infrastructure that supports global competition
6.	<b>X</b>	Improve Hawaii's Small Business Environment: providing direct export support to Hawaii's S&T SMEs and supporting the development of technology which can increase productivity in all economic sectors improves Hawaii's ability to compete

If your program is not linked to any of the six objectives, explain why it is still important.