



TWELFTH ANNUAL REPORT TO THE MAINE LEGISLATURE

FY11: July 2010-June 2011

**Prepared for:
The Labor, Commerce, Research and Economic Development Committee**

The Maine Technology Institute “shall encourage, promote, stimulate and support research and development activity leading to the commercialization of new products and services in the State’s technology-intensive industrial sectors to enhance the competitive position of those sectors and increase the likelihood that one or more of the sectors will support clusters of industrial activity and to create jobs for Maine people.”

1999, 5MRSA c407 § 15302

www.mainetechnology.org



TWELFTH ANNUAL REPORT TO THE MAINE LEGISLATURE

FY11: July 2010-June 2011

**Prepared for:
The Labor, Commerce, Research and Economic Development Committee**

Dear Friend of MTI:

We are pleased to present the Twelfth Annual Report of the Maine Technology Institute (MTI) for the period July 1, 2010 - June 30, 2011.

MTI strengthens Maine's innovation economy as the State's only source of research and development financing for businesses and the cultivation of our technology industries.

Highlights of the year included:

MTI approved awards totaling 127 new technology development projects to innovative companies and organizations across the state, totaling nearly \$14.1 million. This funding leveraged an additional \$33.7 million in matching investment and resources by the companies and other award recipients.

Of that, MTI approved awards to 10 Maine companies, nonprofit research organizations and universities totaling approximately \$7.25 million for Maine Technology Asset Fund (MTAF) technology development projects, financed by State bonds. These diverse and exciting projects, chosen through a rigorous and highly competitive process, are leveraging close to \$20 million in matching funds and sustaining and creating good jobs across the state. **MTI and Maine were also recognized nationally with an award for the design and early impact of the MTAF program by the Ohio-based State Science and Technology Institute.**

MTI received over \$1.4 million in repayments of Development Awards from companies that had succeeded in bringing new technologies to market. This was an all-time high in repayments, indicating that innovative Maine companies are succeeding at commercializing new technologies despite the still anemic national economic conditions. MTI turns around these repayments and uses them to fund awards and related support for other entrepreneurial Maine companies.

MTI was again ranked highest among 13 other Maine and out-of-state business resources by 325 companies that completed confidential surveys as part of the State's independent evaluation of its innovation-based economic development investments. Historically, this evaluation has noted that **every \$1 awarded by MTI leveraged more than \$10-\$14 in public and private financing for Maine's innovation economy** – a robust return on investment for Maine taxpayers.

Thanks to the sustained support of our partners, policy makers, and the hard work of the approximately than 100 members of our volunteer boards and the MTI staff team, it has been another very successful year. Looking forward, MTI pledges to continue to invest in promising technologies that boost the competitiveness of Maine companies and sustain and grow quality jobs for people across the State. Thank you for your support.

Jim Detert, Site Director
Molnlycke Health Care
MTI Board Chair

Betsy Biemann, President
Maine Technology Institute

Contents

Executive Summary	1
The Maine Technology Institute During Fiscal Year ‘11	2
MTI Funds Innovative Maine Companies	3
Core Funding Programs	4
Business Innovation Programs	4
Seed Grants	4
Development Awards	5
Accelerated Commercialization Fund	7
SBIR/STTR Awards and Federal Funding Assistance	8
Awards to Strengthen Maine’s Technology Clusters	9
Bond Programs	10
Maine Technology Asset Fund	10
Maine Biomedical Research Fund	12
Maine Marine Research Fund	12
Sector-Specific Assistance	13
Effective Partnerships	13
Outreach	16
Impact and Accountability	18
Finances	20
Looking Ahead	21
Appendices	23
A. Board of Directors	
B. Technology Board Members	
C. Staff Biographies	
D. Seed Grant Recipients FY11	
E. Development Award Recipients FY11 and Accelerated Commercialization Fund Recipients FY11	
F. SBIR Assistance Program Awards FY11	
G. Cluster Initiative Award Recipients FY11	
H. Maine Technology Asset Fund Recipients FY11	
I. Independent Auditors’ Report	

Executive Summary

The Maine Technology Institute (MTI) supports technology development by Maine businesses and entrepreneurs in the state's seven targeted sectors, helping them bring to market cutting edge products, processes and services. With MTI's support, companies become more competitive, provide higher-paying jobs for people across the state and purchase goods and services from other Maine companies, thus stimulating Maine's economy.

Early-stage technology development is the most challenging step for a Maine company to finance on the way to profitability and growth. As the state's only financial support for private sector research and development (R&D), MTI funding provides the crucial link that helps drive ideas from the laboratory to the marketplace. MTI also supports the development of Maine's technology clusters, providing funds and incentives for collaborative ventures that strengthen innovation, networks and collective marketing in industries poised to benefit Maine's economy.

MTI accomplishes its purpose by cost-sharing R&D and industry cluster-building projects with Maine businesses and organizations through competitive award programs and by helping Maine companies secure Federal funds for research and development projects. Per its legislative mandate (5MRSA §15302), MTI's funding programs the following seven technology sectors:

- Advanced technologies for forestry and agriculture
- Aquaculture and marine technology
- Biotechnology
- Composite materials technology
- Environmental technology
- Information technology
- Precision manufacturing technology

MTI also administers the Maine Technology Asset Fund, financed by state bonds, which aims to strengthen Maine's economy by moving technologies to the commercial market and helping Maine institutions compete for Federal research funds through funding equipment and facilities expansion for R&D. Previous bond-funded programs close to completion have helped build the research and development capacity of Maine's nonprofit research laboratories and strengthen the state's biomedical and marine industries, while expanding the state's technology employment base.

The Institute is a publicly-funded, private nonprofit corporation, governed by an industry-led Board of Directors (Appendix A). The president of the Institute is a director at the Department of Economic and Community Development and reports to both the Commissioner and the MTI Board.

MTI's success is due in large part to the dedication of approximately 100 Maine business leaders and technology experts who serve as volunteers on MTI's Board of Directors and seven technology boards (Appendix B). Each year these volunteers together contribute over 5,000 hours to proposal evaluation, funding recommendations and guidance on

matters of policy and direction, based on their in-depth knowledge of their industries' technologies and Maine's assets.

Although MTI has a statewide reach and an ambitious mission, it is a lean, cost-effective operation with a team of seven full-time and one half-time employees. Together with the MTI president, this team implements the policies and programs of the MTI Board (Appendix C).



MTI's FY11 employees: Front row: Shane Beckim, Jessica Gogan, Linda Adams, Andrea Philips and Patti Sutter. Back row: Betsy Biemann, Roger Brooks, Joe Migliaccio and Jim Fecteau.

This report summarizes the activity of the Maine Technology Institute for the period July 1, 2010 to June 30, 2011.

The Maine Technology Institute During Fiscal Year '11

The Institute fulfills its mission by co-funding high-potential technology development projects with Maine entrepreneurs and organizations that bring new products, systems and services to the market, invigorate Maine's industry clusters and create and sustain good jobs across the State.

MTI's programs include:

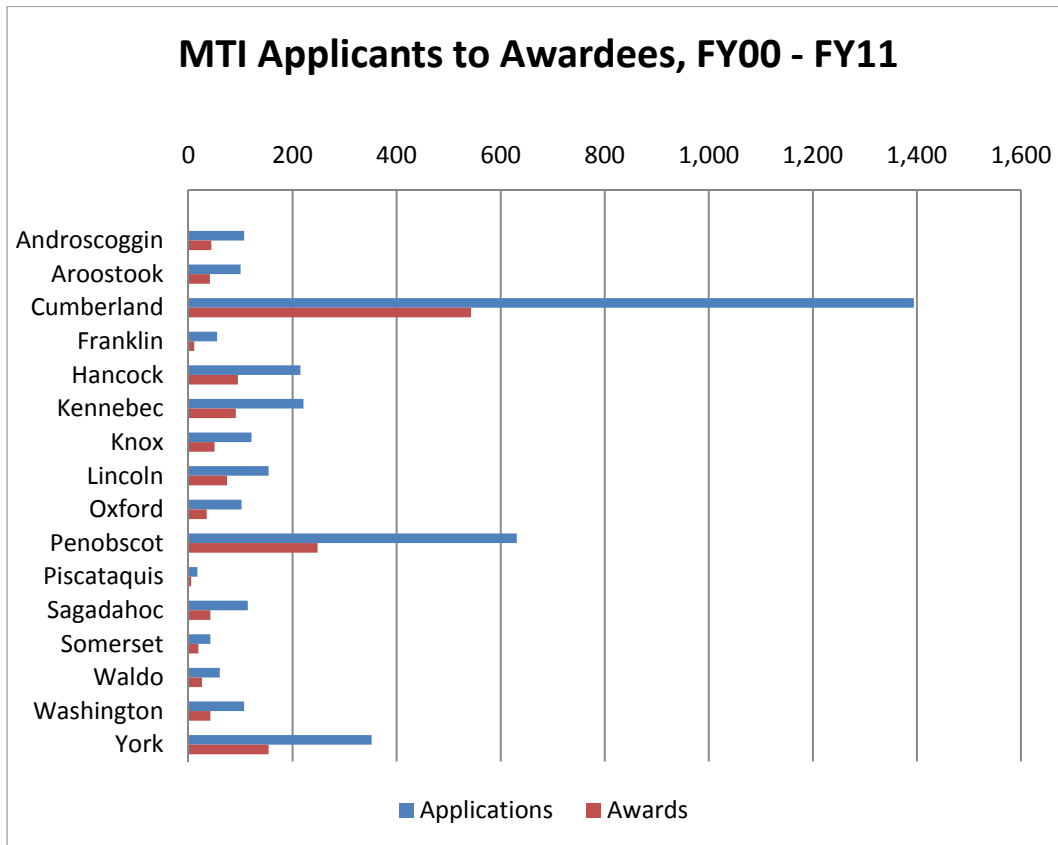
- Business Innovation Programs
 - Seed Grants
 - Development Awards
 - Accelerated Commercialization Fund
 - SBIR/STTR Awards and Federal Funding Assistance
- Cluster Initiative Program
- State bond-funded Programs
 - Maine Technology Asset Fund
 - Maine Biomedical Research Fund
 - Maine Marine Research Fund

MTI Funds Innovative Maine Companies and Organizations

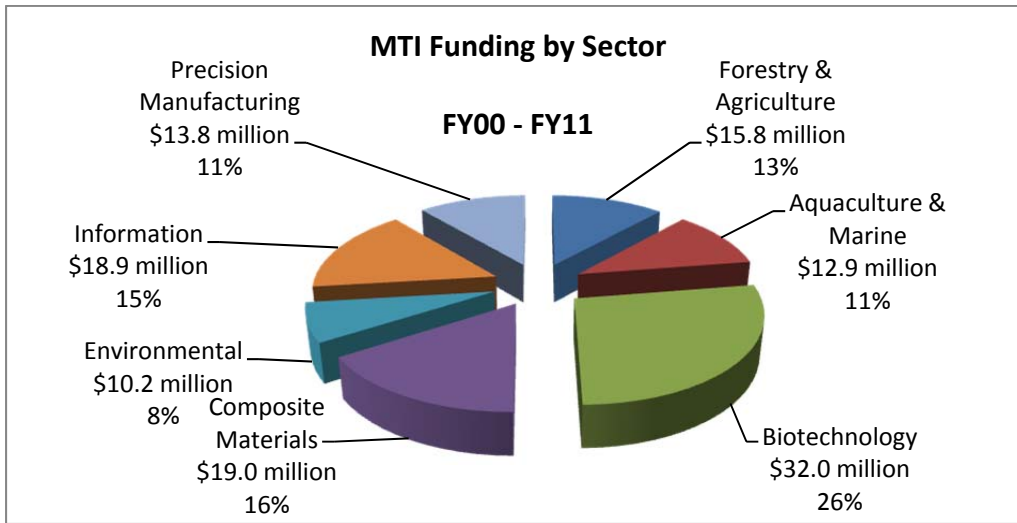
During FY11, MTI approved awards to 127 new technology development projects, totaling nearly \$14.1 million. This funding leveraged an additional \$33.7 million in matching investment by the companies and other award recipients.

Since its inception in 1999, MTI has funded 1,552 technology development projects throughout the state of Maine, a financial commitment of nearly \$126 million that has leveraged an additional \$216 million for a total \$342 million. These resources have enabled Maine companies to secure their intellectual property, launch more competitive products and services, grow faster than average companies across the state, generate jobs and purchase goods and services from other Maine companies.

These early stage R&D efforts are helping to drive new products and services to the market, creating jobs in the technology-intensive sectors. Independent researchers from the University of Southern Maine have noted that “MTI programs have been very successful in a short time supporting substantial innovative activity, particularly in the private sector, that is likely to have positive economic impacts throughout Maine.”



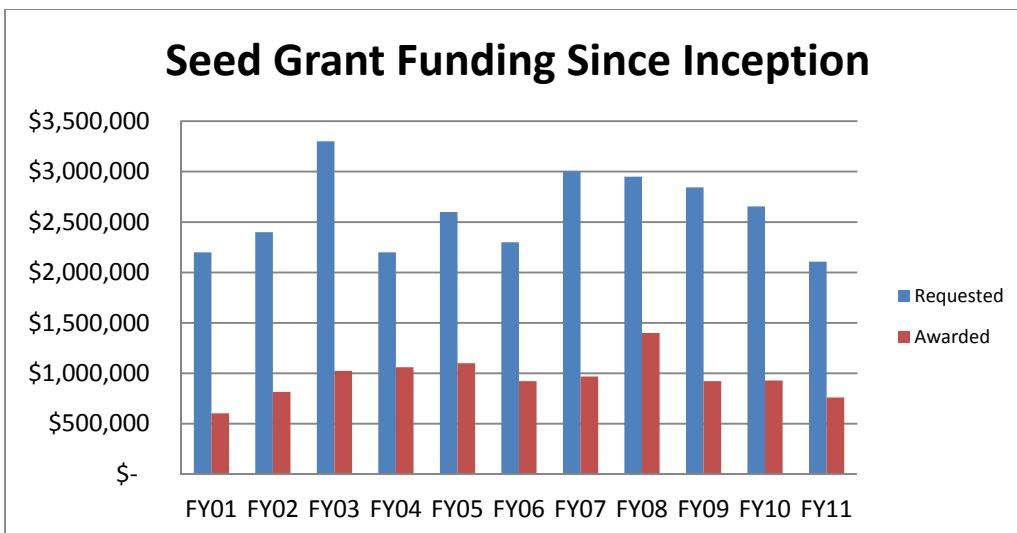
MTI funding reaches all 16 counties in Maine and across the State’s targeted technology sectors, as shown in these tables.



Business Innovation Programs

Seed Grants

Seed Grants of up to \$12,500 each are offered six times a year to support early-stage R&D activities, such as market research, patent filings, feasibility studies and early prototype development. A company may win multiple Seed Grants, but may not exceed \$25,000 for any one technology. In FY11, 66 Seed Grants totaling over \$761,000 were awarded in six rounds that averaged 31 applications per round. The matching funds leveraged by these awards totaled over \$1.4 million (Appendix D). Since 2001, MTI has approved 1,098 Seed Grants for over \$10.6 million and matched by over \$17.2 million.



Seed Grant Profile: Sea & Reef Aquaculture

Founded in 2003 by Soren Hansen while he was a doctoral student at the University of Maine in Orono, Sea & Reef Aquaculture, LLC, specializes in culturing high-value marine ornamental fish for the marine aquarium hobby. Sea & Reef grew out of doctoral work by Hansen and Chad Callan at UMO's School of Marine Sciences. Hansen, a native of Denmark, and Callan were both interested in tropical fish and wanted to find an environmentally safe way to raise them. Ninety-five percent of the 1,500 saltwater tropical fish species sold for use in home aquariums are collected in the wild from coral reefs in the Pacific Ocean, and harvested by divers who use methods that kill fragile coral and other non-target organisms. Hansen and Callan wanted to help save the coral reefs by supplying high quality captive marine ornamental fish. Sea & Reef fish have numerous advantages compared to wild collected fish; they are disease and parasite free and already acclimated to tank conditions, so they have longer life spans.

Sea & Reef recently moved from Orono to the Center for Cooperative Research (CCAR) in Franklin to expand its production capability to raise 20 different species and color morphs of marine ornamental fish. The company has three full time staff including Hanson. In 2009, Hanson hired Brandon Weik, a graduate of the University of New England with a bachelor's degree in Aquaculture and Aquarium Sciences. Sea and Reef hired Jonathan Labrecque in May 2010 right after he graduated from UMaine's School of Marine Sciences, where he previously worked at Sea and Reef as a work-study student.

Sea and Reef's most recent success is the development of 2 unique color morphs – the Maine Blizzard Clownfish™ and the Maine Mocha Clownfish™. The fish are sold to pet stores across the United States and to overseas markets via air transportation. This Maine business continues to grow its production and capture an increasingly larger share of the \$200 million/year US market for marine ornamental fish by developing and marketing environmentally-friendly products.

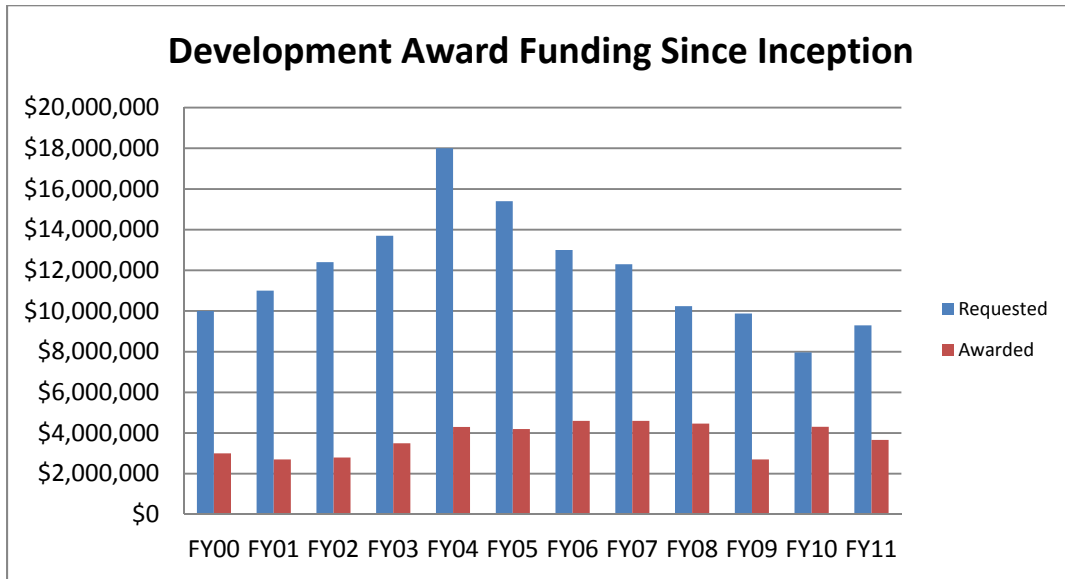
Sea & Reef's story demonstrates how MTI support, via two Seed Grants, can help catalyze a new company's launch and development in a rural community, enable Maine's students to become entrepreneurs, and build on Maine's infrastructure and natural resources to create high value-added products for sales into growing national and international markets.

Development Awards

Development Awards are conditional loans of up to \$500,000 offered on a competitive basis three times a year to fund later stage R&D activities leading to commercialization of new products such as prototype development, testing and manufacturing pilot projects. Loan repayment is triggered by commercialization of the technology.

During the fiscal year, MTI Technology Boards reviewed 29 Development Award applications from Maine businesses. Twelve applications were funded for a total of \$3.6 million and matched by over \$4.9 million (Appendix E). Companies that had received earlier Development Awards made payments back to MTI totaling \$1,434,614 this year, the highest repayment amount to date and an indication of commercialization success.

These repayments are recycled into new awards for Maine companies in support of technology development across the state.



Development Award Profile: CashStar

Founded in 2008 by Maine entrepreneur, David Stone, CashStar has developed technology that allows online retailers to provide digital gift cards to customers in lieu of plastic cards. Today, CashStar has grown to a staff of over 50 who work with national retail clients. CashStar expects to continue to grow and provide quality jobs in Maine as it expands its 200-strong network of retail customers, which include firms such as Mandarin Oriental Hotel Group, Home Depot, Williams-Sonoma/Pottery Barn, Best Buy, Starbucks, CVS, the Gap, Regal Entertainment Group, Papa John's, and others. Its powerful platform delivers retailers high-margin sales, promotes online as well as in-store traffic and encourages customer loyalty by providing consumers with personal and convenient gifting experiences.

CashStar operates in a market where electronic gift card sales are roughly \$1 billion to \$1.5 billion annually, a fraction of the \$91 billion gift card industry, which is still dominated by plastic cards. Industry-wide electronic gift card sales are increasing 300 to 400 percent yearly, cutting into sales of plastic cards. MTI funding has supported CashStar's development with three Development Awards in 2009, 2010 and 2011 totaling \$806K which CashStar has matched dollar for dollar.

This year, CashStar was named one of the 40 best companies to work for in Maine by the Maine State Council of the Society for Human Resources Management, and recognized as the Gazelle Company of the Year in 2010 by TechMaine and several other national entities (Best Gift Card Program, Fortune and MASS High Tech).

Accelerated Commercialization Fund

The Accelerated Commercialization Fund (ACF) provides follow-on funding to help successful MTI-funded companies bring their new products or services to market. The funding is available for companies that have successfully completed an MTI Development Award-funded project and are seeking next stage investment from outside angel investor(s) or venture capital funds. The ACF fills a gap for companies seeking to raise equity capital needed to bring their new products and services to market. In FY11, MTI's Board approved two Accelerated Commercialization Fund investments totaling \$134,231 to companies that had previously completed Development Award-funded projects (Appendix E).

ACF Profile: Ocean Renewable Power Company (ORPC)

In 2008, Ocean Renewable Power Company (ORPC) became the first company to generate electricity from Bay of Fundy tidal currents near Eastport and Lubec without the use of dams or impoundments. In 2010, ORPC successfully designed, manufactured and operated the largest ocean energy device ever deployed in U.S. waters. Today, ORPC is considered an international leader in the emerging tidal energy industry. In 2012, the company will install and operate its first grid-connected TidGen™ Power System in Cobscook Bay, delivering clean, renewable electricity to the Maine grid.

Over the last four years, ORPC has spent well over \$8 million in Maine, helped create or retain more than 100 jobs and extended its supply chain reach to 13 of Maine's 16 counties. The company directly employs 23 people at its Portland and Eastport offices. In Washington County alone, ORPC has spent \$3.4 million on payroll, materials, supplies, and other goods and services. More than 40 local contractors support its operations center and on-water projects there.

ORPC has worked closely with the communities of Eastport and Lubec, including town officials, business people, environmentalists, fishermen, other mariners and residents to advance its projects. ORPC also initiated the tidal energy research program at the University of Maine, which has since blossomed into a partnership between the University and Maine Maritime Academy.

Beginning in 2007, ORPC won a \$300,000 Development Award from MTI, and in 2008, a \$150,000 Accelerated Commercialization Fund investment to advance its OCGen™ Tidal Turbine prototype. Since then, ORPC has gone on to secure more than \$20 million in private investment and competitively awarded U.S. Department of Energy grants. "We would not have reached our level of success if not for the Legislature's support of the Maine Technology Institute and recognition of the value of research and development investment in the state's economy," said Christopher R. Sauer, ORPC's President & CEO. "This public sector leadership has helped bring millions of private sector dollars into the Maine economy, directed federal money to our state and enhanced our company's ability to commercialize our power systems."

SBIR/STTR Awards and Federal Funding Assistance

The Federal Small Business Innovation Research and Small Business Technology Transfer Research (SBIR/STTR) program awards more than \$2.3 billion annually to small business across the nation for innovative research and development projects in areas of interest to eleven Federal agencies. MTI helps Maine companies learn about these programs, prepare competitive applications to secure this funding, and then build successful enterprises based on the new technologies developed with the funding. MTI does this through the following award and technical assistance components:

Helping Maine Companies Secure Federal grants

MTI's Phase 0 Program provides financial assistance to Maine companies that are applying to the Federal SBIR/STTR program. Maine companies can request up to \$5,000 from MTI to help them prepare competitive proposals for these Federal grants. Applications to MTI for Phase 0 support are accepted on a rolling basis to better coincide with SBIR award schedules and allow maximum time for preparation of the most competitive proposals. In FY11, 18 Phase 0 awards were approved, totaling \$85,783, matched by company contributions of over \$125,000 (Appendix F). Since MTI's Phase 0 program's inception in early 2005, more than \$544,000 in Phase 0 awards have been approved and matched by over \$771,000. Through calendar year 2010, Maine company applications for this Federal funding assisted by MTI Phase 0 awards brought more than \$9 million in SBIR/STTR grants from Federal agencies to Maine.

Helping Companies Translate Technology Development into Business Success

Pre-Phase II SBIR/STTR matching grants are for Maine small businesses that have received a Federal SBIR/STTR Phase I award for research and development. MTI's Pre-Phase II grants provide an additional \$10,000 that is used for commercialization and business development activities not covered by the Federal funds that help companies to secure Phase II funding and to bring their new technology to the market successfully. In FY11, seven Pre-Phase II awards were approved for \$69,914 and matched by SBIR Phase I awards totaling \$735,037 (Appendix F).

Technical Assistance Securing Federal SBIR/STTR Funding

MTI also helps Maine companies learn about and navigate the complex Federal SBIR/STTR program through no-cost technical assistance. During the last several years, MTI's efforts have helped increase the amount of Federal funding received by Maine companies for research and development under this program, which has contributed to the competitiveness and growth of these companies. Since MTI's inception in 1999 through Federal FY10, Maine small businesses have won 262 awards totaling over \$63.5 million.

MTI's outreach, awards and SBIR/STTR no-cost consulting support continue to help Maine companies learn about these important Federal programs, identify opportunities that fit their technology areas, and prepare competitive applications for SBIR/STTR funding. During this fiscal year, Maine small businesses received six SBIR/STTR awards totaling \$1.66 million.

SBIR Profile: Ocean Farm Technologies

Founded by former fisherman and Maine entrepreneur Steve Page, Ocean Farm Technologies Inc., (OFT) located in Searsmont, develops and markets innovative technology for aquaculture in exposed open ocean conditions. Companies using OFT's net pens represent a new and growing number of firms globally pursuing sustainable open ocean aquaculture. OFT's patented Aquapod™ is a unique containment system suited for rough open ocean conditions and a diversity of species. Aquapod net pen systems, which have grown in size from 10' diameter to 80', are now being exported to eight countries including South Korea and Mexico for offshore cod and shrimp aquaculture. OFT's employee base has grown from five to 13 and is expected to grow to 16 by the end of 2012.

OFT has raised \$3.9 million of private capital and over \$800,000 in SBIR funding. In 2011, OFT was one of 44 small businesses nationally that were honored by the U.S. Small Business Administration for their research and development success driving innovation and creating new jobs.

Awards to Strengthen Maine's Technology Clusters

Recognizing that dynamic technology clusters require more than a group of individually successful companies, MTI offers awards for collaborative, industry-driven activities aiming to boost activity within and among the seven targeted industry sectors. These awards support the connection among and joint action by similar companies, growing out of the common knowledge, skills, obstacles and innovation shared by these companies and technology partners. These joint efforts in turn stimulate entrepreneurship and lead to new products and services in Maine's technology-intensive clusters.

MTI's Cluster Initiative Program provides planning and feasibility projects (applications accepted on a rolling basis) of up to \$50,000 and competitive multi-year implementation awards totaling up to \$500,000 (with applications accepted twice a year). The program also allows applications that aim to strengthen multiple clusters simultaneously by addressing a common challenge (such as entrepreneurial development).

In FY11, MTI approved funding for eight awards aiming to strengthen Maine's high-potential technology clusters, totaling nearly \$1,860,000 and matched by over \$2,720,000 (Appendix G). All together MTI has provided over \$10 million in cluster awards, matched by more than \$20.5 million for 72 projects that support Maine's technology-driven businesses by improving the infrastructure, resources, connections and linkages necessary for the innovation economy to thrive. Awards made in FY11 included

collaborative projects supporting Maine composite, medical device, renewable energy and biotech clusters.

Cluster Initiative Profile: The Maine Aerospace Alliance

In 2009, MTI awarded a Cluster Enhancement Award of \$499,604, matched by outside funding of \$590,415 to the Manufacturers Association of Maine (MAMe) to create the Maine Aerospace Alliance (MEAA). With the funding, MAMe created an alliance of existing manufacturers that are engaged or had interest in entering the aerospace market. The project focused on reducing industry “barriers to entry into the market”, creation of aeronautical engineering courses at UM, industry certifications and training through the Business Growth Services (BGS) division at MAMe. In 2010, according to a report prepared for MTI, the cluster included about 74 companies and 8,350 Maine jobs.

To date, MEAA has provided 44 companies with certifications, training and business services during this project. Silvex, a coating company located in Portland, used MEAA services to increase market share. As a result, Silvex has added two and retained six jobs. Specialty Product Company (SPC), located in Whitefield, has 20 employees. SPC received ISO certification required for contract work and added 5,000 sq. ft. of building space to accommodate their increased contract work. SPC has added three and retained seventeen jobs as a result of services provided through MEAA.

Bond Programs: Building the Research-to-Market Pipeline in Maine

MTI administers three bond-funded programs: the Maine Technology Asset Fund aimed at bringing innovative Maine technologies to the market by supporting equipment and lab facilities, and the Maine Biomedical Research Fund and the Maine Marine Research Funds to expand Maine’s research capacity in biomedical and marine research.

Maine Technology Asset Fund

In November 2007, the Maine State Legislature authorized and Maine voters approved \$50 million in bond funds for research, development and commercialization projects that boost economic development and create and sustain good jobs across the State. The Legislature directed MTI to develop and administer this venture, based on its track record of managing high-impact innovation funding programs in the for-profit, nonprofit and university sectors. In June 2010, Maine voters approved an additional \$3 million to the Maine Technology Asset Fund.

MTI requires MTAf applicants to outline how they will use the requested equipment or facilities to develop products, processes and other innovations that can be brought to the marketplace, grow job opportunities and businesses in Maine, and/or attract Federal and other funding that expands the State’s research infrastructure in ways that boost the Maine economy.

Maine companies, higher-education institutions and non-profit organizations that work in the State's targeted technology sectors are eligible to compete for MTAF awards. Award recipients are required to match the MTAF funds with at least one dollar for every dollar awarded. The recipient's co-investment in the project helps to insure the organization is equally invested in the new technology and has adequate resources to advance the project; it also expands considerably the overall economic benefit for Maine.

Awards approved in Round One (August 2008), Round Two (June 2009), and Round Three (October 2010, Appendix H) were reviewed via an independent and competitive process managed by MTI together with the American Association for the Advancement of Science (AAAS), a respected scientific organization that has worked with over 30 states to implement research and technology commercialization programs. In these three competitive rounds, MTI received 134 applications for over \$234 million, and executed awards totaling \$52.8 million to 35 companies and organizations across Maine. Awards were based on five criteria, listed in order of priority:

- Economic Growth and Impact
- Scientific or Engineering Merit and Feasibility
- Team and Institutional Merit and Commitment
- Relevance to Maine's Innovation Economy Needs
- Collaboration

Once MTAF contracts are executed for these projects, which can last for up to five years, award recipients are reimbursed for facilities construction and renovation expenses as well as equipment purchases as per their approved project and timeline. As of June 30, 2011, MTI had reimbursed \$26,272,902 of such expenses. Preliminary economic impact reported by that date included:

- New jobs created: 447 (jobs in Maine's technology sectors historically pay 37% higher than the average Maine wage)
- Existing jobs preserved: 405
- New products: 10
- New patents or other intellectual property protection: 49
- New grants or contracts: \$99,326,826
- New debt or equity investment: \$23,750,000

This data will be further detailed in the State's comprehensive R&D evaluation report, which will be completed in January 2012.

MTAF Profile: Bigelow Laboratory for Ocean Sciences

Bigelow Laboratory for Ocean Sciences is an internationally recognized leader in global ocean research. The Laboratory is primarily funded by competitive federal research grants, attracting over \$100 million to Maine during its 37-year history. Through an MTAF award of \$4.45M, the Laboratory is developing the Bigelow Center for Blue Biotechnology (BCBB) on its new Ocean Science and Education Campus at East Boothbay. The MTAF award provided
(cont'd)

MTAF Profile: Bigelow Laboratory for Ocean Sciences (Cont'd)

the leverage for two major federal grants totaling \$14.12 million, and in September 2010, the Laboratory began building the new \$33 million campus on the 64-acre shorefront property it purchased in East Boothbay seven years ago. The remainder of the cost of campus construction is being covered by the Lab's fundraising campaign and mortgage. The BCBB is the first of three science wings on the campus and opened in November 2011.

Over the next five years, the Laboratory's goal is to increase annual revenues from \$7.6 million to \$20 million. Once construction of the campus is completed, (its science facilities will grow by more than 40,000 square feet to about 62,000 square feet) the Laboratory expects to double its employment to over 120. The expansion enables Bigelow to partner with Maine businesses to transfer technologies to commercial applications. In September 2011, two Technology License Agreements were announced that will facilitate access to and collaboration with Bigelow scientists. One agreement is with Kennebec River Biosciences, Inc. (KRB) of Richmond, Maine and another is with Fluid Imaging Technologies, Inc. (FIT) in Yarmouth, Maine. KRB is a source of aquatic animal health products and services, and performs diagnostic and certification testing on aquatic species from cultured and wild sources. FIT produces industry-leading particle analysis instrumentation based upon digital imaging, with markets that include the pharmaceutical, food and beverage, chemical, abrasives, and plastics industries, among many others. Both of these Maine businesses have been growing independently due to their own innovation and will now leverage that growth through their partnership with Bigelow.

Maine Biomedical Research Fund

MTI administers the Maine Biomedical Research Fund, which supports biomedical research in Maine and was financed by State bonds (as well as General Funds in its early years) and is governed by the Maine Biomedical Research Board. Between 2001 and 2005, the State approved \$42.5 million for the Fund and these funds have been awarded by the Maine Biomedical Research Board for biomedical research projects that extend for up to five years.

During the fiscal year, no new funds were appropriated by the State for this program and no new awards were made by the program. MTI made final payments and monitored previous awards to three organizations in Scarborough and Bar Harbor that carry out biomedical research. These organizations are the Foundation for Blood Research, the Jackson Laboratory and the Maine Medical Center Research Institute.

During FY11, MTI disbursed \$890,107 to this Fund's awardees for projects that had been approved in previous fiscal years. These funds concluded projects, such as the development of the Maine Center for Clinical Epidemiology at the Foundation for Blood Research. As of June 30, 2011, all outstanding Maine Biomedical Research Fund projects had been completed.

Maine Marine Research Fund

The Maine Marine Research Fund was created to support marine research and boost employment in Maine through investment in eligible Maine non-profit institutions, state government and quasi-governmental agencies and academic institutions. The Fund is

governed and administered by the MTI Board of Directors. Similar to the Maine Biomedical Research Fund, there were no new funds appropriated by the State for this program in the fiscal year and no new awards were made by the program. In FY11, MTI disbursed \$141,294 to this Fund's award recipients as they carried out project milestones. These payments funded activities such as equipping the Maine Aquatic Animal Health Laboratory at the University of Maine for use by researchers and industrial partners, and the enhancement of the Gulf of Maine Research Institute Ocean Observing System in the Gulf of Maine to stimulate research and inform industry. As of June 30, 2011, activity on all projects had been completed, except for the University of Maine at Machias and the Gulf of Maine Research Institute, which received extensions for several months into the subsequent fiscal year.

Sector-Specific Assistance: Renewable Energy Technology

From time to time, MTI has the opportunity or mandate to focus additional support on a particular sector. In 2008, the Maine Legislature authorized the annual distribution of 35% of the Renewable Resources Fund at the Public Utilities Commission (later transferred to the Efficiency Maine Trust) to MTI to support the development and commercialization of renewable energy technologies. In FY11 MTI was allocated \$152,471, and distributed funds to Maine companies via one Development Award, six Seed Grants, and two Pre Phase II awards to advance the commercialization of tidal, wind, solar and biofuel technologies.

Effective Partnerships

University of Maine System

Active collaboration between the University of Maine System and MTI continued in FY11. MTI's Board approved five Seed Grants, two Cluster Initiative Awards and two Technology Transfer Development Awards to University of Maine Orono and University of Southern Maine projects during the fiscal year. In addition, MTI's team made multiple presentations at University System campuses and worked collaboratively with the Knowledge Transfer Alliance at the University of Maine Business School, the Target Technology Center, the Forest Bioproducts Research Institute, the Advanced Structure and Composites Center, and the University of Maine Innovation Engineering Program.

University involvement with MTI included University Centers and personnel being an award recipient, a subcontractor to Maine companies funded by MTI, providing incubator support to MTI-funded companies, commercialization support of UM technology, technology licensing, and business development support to MTI applicants and award recipients. In addition, Jake Ward, the University of Maine's Assistant Vice President for Research, Economic Development and Governmental Relations served on the MTI Board (as the University System Chancellor's designate) and as MTI's Board Secretary.

Maine's Technology Development Centers

MTI funding is critical to the start-up technology companies that receive assistance through Maine's incubators, called Technology Centers. Most of the companies that are located at the Centers as tenants or avail themselves of support and counseling from the Centers are very early stage companies that are still in the research and development phase as they move towards commercialization. MTI funding is critical to their survival as they are still too early for angel or venture capital investment and far from being "bankable".

In FY11, MTI continued its highly engaged relationships with these Centers. Two out of three of the Center directors served on MTI technology boards and thereby participated in MTI award review processes. In addition, the Centers provided facilities for MTI's workshops and seminars and promoted MTI programs to their clients. One of the Centers, the Maine Center for Entrepreneurial Development in Portland, conducted its second class of its entrepreneurship development program, called "Top Gun". This competitive program included several MTI-funded companies and connected them with approximately two dozen volunteer industry mentors. MTI management staff served as advisors to the program's development as well as mentors of Top Gun entrepreneurs.

In the case of the Target Technology Center in Orono, MTI funding has been critical to moving affiliated companies and technologies forward either to the point of successful commercialization or to the point that their companies become attractive to other, later stage investors. During FY11, Target Technology Center staff assisted multiple companies to prepare successful proposals for MTI funding.

Finally, during FY11 the Maine Aquaculture Innovation Center (MAIC) provided support to a number of MTI funded aquaculture companies, including Sea & Reef Aquaculture and Mook Sea Farm.

Maine International Trade Center

Export markets are an increasingly important source of customers for Maine technology companies. MTI and the Maine International Trade Center (MITC) continued their partnership offering MTI Development Award companies one year of free membership to the Trade Center so that they can access the Center's export assistance services and be more likely to position their technologies for export. As part of our collaboration, MTI staff annually make at least one presentation to MITC members, to make sure that they are familiar with MTI programs, and MTI and MITC staff meet periodically to explore new avenues for joint work.

Maine Manufacturing Extension Partnership

Maine MEP engages with MTI-funded companies for follow-on technical assistance projects. Maine MEP projects with MTI recipients concentrated on quality management systems audits, lean manufacturing training and implementations, facility layouts,

innovation engineering, supply chain connections and workforce development, accounting for hundreds of hours of focused training and consulting services.

According to Maine MEP records, Maine MEP also contributed over 100 staff hours during this period to promote MTI programs to Maine manufacturers and to introduce MEP services to MTI awardees. Significant support has been to the Maine Food Producers Alliance representing over 70 food manufacturers as well as the food industry cluster support assets and suppliers. Additional support has been extended to the University of Southern Maine in innovation engineering and medical device cluster initiatives and numerous manufacturing-associated MTI program applications. Fifty-nine companies reported impacts with MEP and subsequent follow on referrals to MTI within FY11.

Finally, as part of their ongoing partnership agreement, MTI's awards of over \$2.4 million to manufacturing companies, in combination with other funds secured by MEP, allowed MEP to draw down its full allocation of Federal matching funds, which were used to provide additional services and programs.

Small Business Development Center

MTI and the Small Business Development Center have worked together in multiple ways since MTI's founding. Currently, MTI's President and the SBDC Director participate in the regular DECD meeting of economic development agency directors to discuss current activities and areas for future collaboration and periodically bring their staff teams together to update each organization on its programs and capacities so each can make accurate referrals for Maine businesses. Furthermore MTI staff and its website refer interested company applicants and award recipients to seek out business planning and execution assistance from the regional SBDC business counselors.

Small Enterprise Growth Fund

MTI continued a close and mutually supportive relationship with the State-sponsored venture capital fund, the Small Enterprise Growth Fund (SEGF). MTI and SEGF also worked collaboratively to educate Maine entrepreneurs about sources of capital in Maine, including meeting with companies together and making joint presentations in a variety of events. The two organizations also collaborated closely on the development and implementation of the aforementioned MCED Top Gun program. Finally, eight out of 17 SEGF portfolio companies have secured financing and other assistance from MTI. This confirms that MTI is helping to build a pipeline of companies ready for equity financing here in Maine.

Maine Patent Program

In FY11, MTI continued to fund intellectual property-related activities as part of its awards to Maine companies. This work is only funded after companies have received advice from the Maine Patent Program or intellectual property lawyers that the proposed activity is merited. According to data collected by the firm Camoin Associates for the

State's Comprehensive R&D Evaluation, the Maine Patent Program has counseled 507 companies during the past five years and 48 of these have received MTI support. Furthermore, MPP staff and MTI staff meet periodically to provide each other with program updates and to discuss opportunities for further collaboration.

Private Capital Sources

To help boost access of MTI-funded companies to follow-on funding from private venture capital sources as well, MTI maintained close relationships with many of the venture capital funds and investors in the state and region. The MTI president serves as a member of the Maine Investment Exchange (MIX) Advisory Committee, and in that role helps introduce Maine's technology-intensive companies to early stage equity investors. MTI partners with the Maine Angel Network, the Maine Center for Entrepreneurial Development and others to introduce MTI-funded companies to investors. In addition, in June 2011 MTI co-sponsored a workshop with the E2Tech Council and the New England Clean Energy Foundation that introduced Maine clean technology companies to Boston area venture capital fund managers. Finally, two of MTI's Board of Directors represent the finance sector and include a venture capitalist and a banker. They advise MTI on how the organization can best help Maine companies secure private capital to fund the commercialization of new technologies.

The MTI president and staff network informally on a regular basis with organizations and groups that are potential capital sources, such as the Small Enterprise Growth Fund, the Finance Authority of Maine, Coastal Enterprises, Inc., other early-stage venture funds in the State, as well as the Maine Angel Network and individual investors.

Outreach

It is important that all MTI programs be available and accessible to all eligible entrepreneurs and businesses throughout the State of Maine. In the past year, MTI promoted its programs in a variety of ways, including:

- MTI prepared **statewide press releases** and **worked closely with media outlets** in an effort to promote its programs, program milestones, and to highlight companies who received MTI funding. MTI sent statewide press releases after each round of awards and to announce new programs.
- MTI sent its **monthly e-NEWS** to more than 2,100 individuals, companies and organizations with award deadlines, workshops and seminars, announcements of relevance to the targeted industry sectors and notices of MTI award recipients in the news. This includes a blog that has replaced MTI's former paper newsletter.
- MTI conducts **workshops about how to apply for its programs** and makes **presentations about the importance of innovation to the Maine economy**. Publicized in the press and through the economic development community, these educate the public and help entrepreneurs develop competitive applications and

proposals for MTI funding. In FY11, MTI launched a series of webinars that expands access to MTI application workshops for entrepreneurs across the state.

- MTI's **website, www.mainetechnology.org**, is updated frequently with all of the information and documents necessary to apply for funding, the latest MTI news and deadlines, MTI innovators in the news, a calendar of events, impact information and success stories.
- MTI attendance, sponsorship or presentations across the state continued to increase. In the past year MTI participated in events of, or provided support to organizations including the following:
 - Association for Consulting Expertise
 - Bioscience Association of Maine
 - Blackstone Charitable Foundation
 - Center for Law and Innovation
 - Coastal Enterprises, Inc.
 - Economic Development Council of Maine
 - Environmental and Energy Technology Council
 - Federal Economic Development Administration
 - Federal Small Business Innovation Research Program
 - Federal Start-up America Initiative
 - Finance Authority of Maine
 - Forest Bioproducts Research Institute
 - Gardiner Board of Trade
 - Gulf of Maine Research Institute
 - Maine Angel Network
 - Maine Aquaculture Association
 - Maine Biomedical Research Board
 - Maine Center for Entrepreneurial Development
 - Maine Community Foundation
 - Maine Development Foundation
 - Maine Entrepreneurs Network
 - Maine Fisherman's Forum
 - Maine Food Producers' Alliance
 - Maine Innovation Economic Advisory Board
 - Maine International Trade Center
 - Maine Investment Exchange
 - Maine Manufacturing Extension Partnership
 - Maine Philanthropy Center
 - Maine Procurement Technical Assistance Center
 - Maine Public Utilities Commission
 - Maine Small Business Development Center
 - Maine Small Enterprise Growth Fund
 - Manufacturers Association of Maine
 - Massachusetts Institute of Technology
 - MidCoast Magnet
 - National Collegiate Inventors and Innovators Alliance

- New England Clean Energy Council
- Policy One Research
- Science, Technology, Engineering and Mathematics Summit and Dialogue and Careers Roundtable
- Service Core Of Retired Executives (SCORE)
- Small Business Association of New England
- State Science and Technology Institute
- Target Technology Center
- Tech Maine
- UMaine Advanced Structures and Composites Center
- UMaine Business School and Knowledge Transfer Alliance
- UMaine Innovation Engineering Program
- University of Southern Maine School of Applied Science and Technology
- Youth and Technology for the Immigrant Population

Impact and Accountability

Since its inception in 1999, MTI has funded through its core programs 1,552 technology development projects throughout the state of Maine, a financial commitment of nearly \$126 million that has leveraged an additional \$216 million for a total \$342 million. These resources have enabled Maine companies to secure their intellectual property, launch more competitive products and services, grow faster than average companies across the state, generate jobs and purchase goods and services from other Maine companies.

All MTI-funded award recipients are required to submit information annually to the state's independent evaluation firm for its Comprehensive Research and Development Evaluation for five years following a project's completion. The compiled data are evaluated by this third-party firm to determine the impact of MTI programs as well as other publicly funded innovation programs on Maine's economy. This firm is Camoin Associates, based in upstate New York and Scarborough, Maine, which specializes in economic development planning and impact analysis.

The most recent Comprehensive State Research and Development evaluation report was completed by Camoin in February 2011. The data in this report noted that MTI was ranked highest by the 325 companies that ranked the value and assistance from they received from 14 Maine and out-of-state resources. **The 52% of respondents to this third-party, confidential survey that had received MTI-support noted that MTI's support was "critically important" to their success.** The Camoin evaluation showed the following for company respondents, the majority of which received MTI support:

R&D Performed

- In 2010 the companies received a total of \$2,608,725 in state funding for R&D related activities.

- In 2010 the companies expended a total of \$27,017,248 on R&D from all sources of revenues.
- **Therefore in 2010 every dollar the state contributed in R&D to these companies leveraged 10 dollars in total R&D.**

Employment

- In 2010 these companies directly employed 3,545 persons
- This generated an estimated additional 5,898 indirect jobs
- **This resulted in an estimated total job impact of 9,443 jobs**

Revenues

- In 2010 these companies generated a total of \$913,359,702 in revenues from all sources
- This generated an estimated additional \$665,569,167 in indirect revenues
- **This resulted in an estimated total revenue impact of \$1,578,928,869 or \$605 in revenues for every \$1 spent in R&D support in 2010 (\$350 direct revenues plus \$255 indirect).**

This report can be found at http://maine.gov/decd/decd_information/reports.shtml. A new report by Camoin Associates, covering data collected up to June 30, 2011, will be submitted to the State and available to the public in January 2012.

From time to time, MTI commissions a more in-depth review of the data collected by State's evaluation team, analyzing the data collected from MTI-funded companies only. The most recent such analysis was drawn from awards ending between July 1, 2006 and June 30, 2008 and analyzed by the Center for Business and Economic Research at the University of Southern Maine. These results were presented to the Legislature's Joint Standing Committee on Business, Research and Economic Development by Dr. Charles Colgan, the Center's Associate Director and former State Economist, in January of 2009.

Highlights of that report included the following:

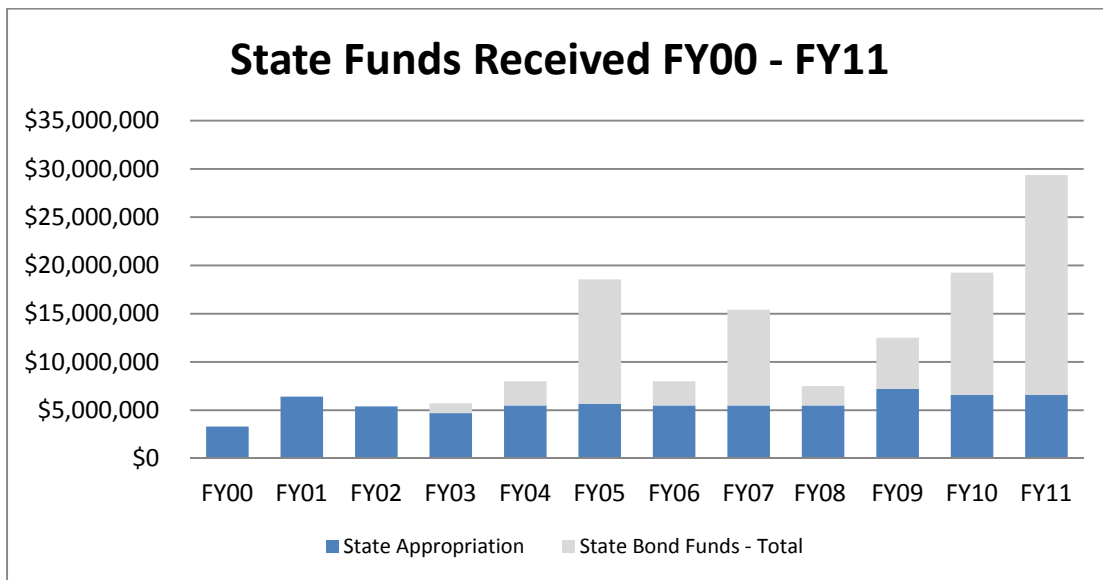
- “MTI projects closing in 2007 and 2008 yielded \$14.27 for every \$1.00 of MTI funds, up from \$12.00 in 2002-2006.”
- “Research is an inherently risky activity, but MTI-funded companies have had a high rate of success.”
- “The number of new products resulting from MTI research that are on sale at the time of survey has been at a consistently high level over the last three years.”
- “MTI research projects continue to generate a high level of successful efforts to secure intellectual property protection in the form of patents, trademarks, and registered trade secrets.

- “Almost all [four out of five] MTI companies reported stable or growing employment from year to year.”
- “MTI is ...the organization whose assistance is most frequently cited as “critically important” by those who use it.”

MTI plans to commission an in-depth analysis of the data collected from MTI-funded companies only in the first half of 2012.

Finances

MTI is funded through an appropriation to the Department of Economic and Community Development (DECD), and is limited by statute to using no more than 7% of the general funds (ie. non-bond) appropriated for its operations.



*Bond funds are not transferred by the State to MTI immediately following voter approval. Funds are drawn down to make reimbursement payments as award recipients achieve project milestones.

Financial highlights of FY11 include the following:

- MTI received \$6,580,814 from a State appropriation through the Department of Economic and Community Development (“DECD”) for general programs and \$22 million of the \$53 million of State bond funds for research, development and commercialization via the Maine Technology Asset Fund (MTAF).
- MTI approved for funding 113 projects totaling just over \$6.5 million, an increase of approximately \$300,000 in core program awards over the previous year. Ten awards representing \$7.2 million were approved this year under the MTAF Program.
- MTI disbursed \$20.3 million according to agreed-upon project award milestones, \$2.4 million more than in the previous fiscal year; the majority of the increase was due to MTAF disbursements.

- MTI's outstanding commitments for its core awards comprise \$6.8 million, including approximately \$2.5 million in approved awards with unexecuted contracts as of June 30, 2011. MTAF outstanding commitments total \$26.4 million, including \$2.2 million in approved awards with not-yet-executed contracts.
- MTI received \$1,434,614 in Development Award repayments, nearly \$1.2 million more than in fiscal year 2010.
- \$247,173 was realized from interest, a decrease of approximately \$54,000 compared to the previous year, due to a reduction in MTI's interest yield rate.
- The bonds that funded the Maine Technology Asset Fund were approved by Maine voters in November 2007 and June 2010. In the prior fiscal years, MTI received General Funds to cover ongoing monitoring and administration costs of this fund. Of the \$223,207 carried forward at the end of FY10, \$176,754 was expended during FY11. MTI's monitoring obligation will extend for four years after June 2011.
- FY11 administrative and operating costs were approximately \$1.1 million, an increase of \$125,000 (11%) over the previous year. MTAF operating costs, particularly one-time application review fees and expenses associated with conducting the third funding competition, rose by \$72,000. Expenses for all other programs and activities were \$53,000, or 6% higher than the previous year. All operating expenses other than the costs to monitor and administer the Maine Technology Asset Fund are paid by interest earnings plus 7% of the State appropriation and of development award repayments.
- In the fall of FY11, MTI's State appropriation was curtailed by \$115,857.
- During Fiscal 2011, the Board of Directors voted to renew recognition of the 7% of the State appropriation that MTI is allowed in order to fund its operating expenses. As a result, FY11's usage of net assets decreased to nearly \$19,000, compared to \$433,000 for the previous fiscal year.

For detailed audited financial information for FY11, see Appendix I.

Looking Ahead

MTI's ultimate goal is to help Maine companies to use technology to grow and remain vibrant and competitive, therefore creating good jobs, greater wealth, and a vibrant economy in Maine. The organization does this by providing seed capital and targeted business assistance to Maine companies for technology development and commercialization and making grants to strengthen Maine's high-potential technology clusters. MTI has operated since 2000 and has developed into a mature organization with an independently evaluated track record that demonstrates a historical return on investment of between \$10-\$14 for every \$1 awarded by MTI.

In the fiscal year covered by this report, MTI stewarded its core Business Innovation Programs, the expanded Cluster Initiative Program and the \$53 million Maine Technology Asset Fund, with minimally increased operating costs. Going forward, MTI

is managing this comprehensive menu of programs in an environment of fiscal austerity, with a continued commitment to excellence in its operations and a high return on investment for taxpayers in terms of growing technology companies, strengthened technology clusters, and good jobs for people across Maine. The related fiscal picture included a reduction in MTI's general appropriation in FY2010 and FY2011 of approximately 10% and a curtailment of just under \$116,000 in the fall of FY2011.

During the upcoming fiscal year, MTI expects to see continued repayment of development awards by MTI-funded companies as products developed with support of early awards enter the market and gain market share; however, these repayments are by nature dependent on company success and broader economic conditions. The fact that the FY11 development award repayments were the highest in MTI history this year shows that investments in innovation do pay off for Maine companies despite the challenging investment and business climate. Over time, such repayments will continue to provide a limited and erratic source of revenues for MTI. This is because MTI awards are made at a very early stage of technology development when technology and business risks are extremely high. In addition, development awards are the only MTI awards that have a payback requirement, which is conditioned only when commercialization is successful. (No interest is charged during the first three years after commercialization, unless the company moves out of state, when special and immediate repayment is required.) Thus, award repayments will never grow sufficiently to replace the funding received through State appropriation and outside grants.

To ensure that MTI continues to achieve its high standards, the organization's Board and staff undertook a strategic planning process that was completed and approved by the Board in the spring of 2010. This three-year plan called for MTI to modify its core business innovation program to provide funding and business development support to accelerate the time to market for new technologies while boosting business access to capital and ultimately profitability and job growth. It also directed MTI to expand its outreach across Maine, both in-person and online, to increase the pipeline of high quality proposals to its programs. Finally, it called for MTI to seek out partnerships within Maine and regionally that will help MTI to advance its mission of stimulating Maine companies to develop new, globally competitive technologies for the market, contributing to their growth and to the growth of vibrant industry clusters across Maine.

Planning and activity began in these areas starting in FY11 and gained momentum in the subsequent months early in FY12. For example, in FY11 MTI evaluated ways to expand access, reduce costs of operations and expand its impact, as well as initiated new partnerships. As a result, early in FY12, MTI launched its updated Business Innovation Program, moved its office to Brunswick Landing and initiated monthly MTI Office Days at the Target Technology Center in Orono. In addition, working with several partners, MTI helped to attract over \$3 million in grants from Federal and philanthropic sources to support innovation and entrepreneurship in Maine. These updated programs, expanded outreach and better-resourced partnerships will ensure that MTI's investments in innovation continue to grow and sustain good jobs across the state and contribute to a prosperous Maine.