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THE THIRD FRONTIER  
ACTION FUND:  
A PERFORMANCE ASSESSMENT

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ZACH SCHILLER  
DECEMBER 2003

# The Third Frontier Action Fund: A Performance Assessment

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## **POLICY MATTERS OHIO**

Policy Matters Ohio, the publisher of this study, is a nonprofit, nonpartisan statewide research institute dedicated to bridging the gap between research and policy in Ohio. Policy Matters seeks to broaden the debate about economic policy in Ohio, by providing quantitative and qualitative analysis of important issues facing working people in the state. Other areas of inquiry for Policy Matters have included workforce policy, wages, education, unemployment compensation, housing and tax policy. We are thankful to the George Gund Foundation, the St. Ann Foundation and the Nord Family Foundation for funding for the institute.

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### Executive Summary

Gov. Bob Taft's Third Frontier program to back high-tech business has become an increasingly important part of Ohio's efforts to build a stronger economy. Despite the defeat of Issue 1, which would have allowed Ohio to borrow \$50 million a year for a variety of development purposes, more than \$100 million a year is being spent on the Third Frontier program.

One part of the program, the Third Frontier Action Fund, has been operating for five years. Even before a round of grants approved in October, it had awarded 80 grants worth \$55 million to universities, private companies, and other entities that try to spark high-tech development. Though the program has undergone various changes, its purpose has remained much the same since early on: Providing financial support to projects that contribute to technology-based economic development in Ohio.

The program began as an effort to attract more federal research money to Ohio. The grants now focus on three areas: Early-stage capital for start-up or young technology companies, collaborations to commercialize new technologies, and Gov. Taft's Fuel Cell Initiative. Grants are awarded on a competitive basis and require matching funds. Technology commercialization grants have accounted for half the number of TFAF grants awarded, and most grants recently have gone to private companies. Most grantees have been located in Cuyahoga or Franklin counties.

The largest recipient of TFAF money -- \$4.8 million altogether in four grants over more than five years -- is the Glennan Microsystems Initiative, which aimed to research and commercialize tiny sensors and other devices that can function in harsh environments. Glennan has helped move products closer to commercialization, supported new companies and drawn more backing for its mission, leveraging \$35 million in other support. However, the initiative has generated less than 20 new commercial jobs.

Altogether, the TFAF program's impact on the commercial economy has been slight, and the program has not been sufficiently accountable:

**Jobs:** Many grantees have not aimed directly at creating new positions, and others could yet develop into more substantial employers. However, the Third Frontier Action Fund has not been a big job creator. Total new jobs number in the hundreds. An exact count of jobs created by TFAF grantees is impossible because reporting such figures is not required.

**New products:** Thus far, few products involving TFAF grants have been commercialized. In some cases, companies are making headway, and the program could help generate more successful businesses. But in most instances that will take more than a year or two—or even five, as Glennan's experience illustrates.

**Early-stage capital:** A quarter of the grants have gone for early-stage capital, in whole or part. Altogether, seed and venture funds with TFAF support have raised at least \$134 million. "Between what the (Third Frontier Action Fund) has instigated and what the

private market has, there's quite a lot of venture capital here, compared to two years ago, which is really a sea change," said Frank Samuel, Gov. Taft's science and technology adviser. However, we lack a clear idea of how much early-stage capital the state needs.

The new venture funds have supported more than two dozen new enterprises, in businesses ranging from spinal implants to Internet security. One TFAF-supported fund, Early Stage Partners, has invested in SupplierInsight, a Cleveland software company whose services include helping companies find and evaluate suppliers in low-cost countries. It boasts of having "over 100 trained auditors in China ready to complete supplier facility reviews." The likely outsourcing of manufacturing jobs to China conflicts with the Third Frontier goal of increasing manufacturing investment in the state.

Three TFAF grants benefited companies that later decided to move out of Ohio. They included Cincinnati Machine, which received aid through grantee Techsolve Inc. in developing a new machine tool but shut its Ohio factory; ChipRx Inc., an Ohio State University spin-off company whose founder moved to California and will split its operations between there and Kentucky; and Quark Biotech Inc., which is eliminating its Ohio staff and will do its clinical development in California. Spokespersons for these grantees say they fulfilled their obligations, and grant rules in effect at the time did not require recipients to stay in Ohio.

The Ohio Department of Development (ODOD) has stiffened the rules requiring Ohio benefits since those grants were made. Now, a grantee that moves out of Ohio may have to repay the state the monies it has received, plus interest. However, the department is an inattentive monitor – it appeared to be unaware of ChipRx's relocation, for example.

Grantees are required to report quarterly to the Department of Development. The department says that it asks grantees when report information is missing regarding their progress, but did not respond to a request for details. ODOD keeps no list of when it has withheld funds over questions relating to grantees' performance. This record-keeping policy – or lack of one – does not allow the public to know whether the program is functioning as it should.

Two Columbus-area companies provide much of the evaluation for the state for TFAF applications. ODOD has not always required adequate competition for these contracts. For instance, BizLogx LLC of New Albany, Ohio, was the only company that applied to evaluate the fiscal 2004 and 2005 early-stage capital grant proposals.

If state efforts such as the Third Frontier Action Fund are to succeed they must have clearly defined goals, for both the program as a whole and for individual grantees. Grant evaluators must be selected through a clearly competitive process. The state should monitor the measures taken to ensure Ohio benefits and implement more such reforms. More systematic effort must be made to ensure that grantees are delivering on their promises. Taken together these steps would add accountability to the Third Frontier Action Fund.

## I. Introduction

Gov. Bob Taft's Third Frontier program to back high-tech business has become an increasingly important part of Ohio's efforts to build a stronger economy. Voters recently turned down a proposed constitutional amendment that would have expanded the program by widening the state's ability to aid private businesses and allowing Ohio to borrow \$500 million over 10 years for a variety of development purposes.<sup>1</sup> Despite the issue's defeat, most of the program is already under way, and more than \$100 million a year already is being spent on the existing Third Frontier program.

Among its planned spending over a decade's time are:

- A \$500 million capital program to establish centers of excellence in information technology; advanced materials; power and propulsion; instruments, controls, and electronics; and biomedical technology at universities and non-profit research organizations;
- A \$100 million revolving loan fund to help Ohio manufacturers invest in fixed assets to develop new products in these same five industries; and
- A \$350 million Biomedical Research and Technology Transfer Fund.

Finally, the Third Frontier Action Fund (TFAF) will disburse \$150 million to private companies, universities and not-for-profit or government research institutes. The program, as the latest request for proposals states, provides "financial support to projects that contribute to technology-based economic development in Ohio."<sup>2</sup>

Though it is not as large as some other elements of the Third Frontier, the TFAF is the longest-running Third Frontier program. It started in 1998, when Glenn Brown, Governor George V. Voinovich's science adviser, saw a need to boost the state's investment in technology programs. The fund was expanded after Governor Taft took office, and later was integrated into his Third Frontier. The purpose of this report is to examine its track record.

Since it began, the Third Frontier Action Fund – originally called the Technology Action Fund, a name used interchangeably in this report – has awarded 80 grants<sup>3</sup> worth a total of \$55 million.<sup>4</sup> Though the program has undergone significant changes since it began, its purpose has remained much the same since early on: Providing financial support to

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<sup>1</sup> Policy Matters analyzed the constitutional amendment that would have authorized major changes in state economic-development policy in a previous report, *Exploring the Third Frontier: Constitutional and Fiscal Implications of Issue 1*. October, 2003 [http://www.policymattersohio.org/third\\_frontier.htm](http://www.policymattersohio.org/third_frontier.htm) Beyond its analysis of the ballot issue, this report described the legal framework within which the Ohio Department of Development operates on an ongoing basis.

<sup>2</sup> Third Frontier Action Fund, 2004 Request for Proposals, p. 4. Ohio Department of Development Technology Division

<sup>3</sup> In a few instances, the state continued an existing program and gave more than one grant.

<sup>4</sup> These figures cover the grants awarded between fiscal 1998 and 2003. The state announced an additional 14 grants for FY2004 worth \$13 million in October. However, these have not yet received final state approval.

projects that contribute to technology-based economic development in Ohio. As one might think, these projects are expected to generate economic benefits in Ohio.<sup>5</sup> Analyzing those benefits is the key element in this report. Much of the analysis relies on quarterly and final reports that grantees are required to submit on their projects.

This introduction is Part I. Part II of this report describes the basics of the Third Frontier Action Fund, the grant recipients and where the funds have gone. Part III examines how the program has performed and the economic benefits it has produced. Part IV reviews a number of grants and the program’s requirements for Ohio benefits. Part V assesses the accountability of program grantees, evaluators and the Ohio Department of Development (ODOD). Part VI includes conclusions and recommendations.

## **II Third Frontier Action Fund: The basics**

TFAF has changed since its beginnings as an effort to attract more federal research money to Ohio, particularly for the Glennan Microsystems Initiative.<sup>6</sup> For instance, the program shifted from specifically emphasizing certain industries to not doing so. Then, starting in fiscal 2003, it began devoting resources to supporting a fuel cell industry in Ohio, an effort so new that this report will not attempt to review it. The state approved nearly \$3.6 million in four TFAF fuel-cell grants last spring, and three more worth \$2.8 million were announced in October.<sup>7</sup>

Specific requirements for the program have not been codified into state law. But applicants to the Technology Action Fund, as described in the state’s administrative rules, until recently had to show that assistance would help them “to achieve one or more of the following goals:

- (1) Assistance in obtaining federal research grants that significantly leverage monies to create substantive economic value to the state of Ohio;
- (2) Facilitate technology transfers from universities or federal laboratories within the state to commercially focused entities;
- (3) Expand the research and commercialization strengths of the state in sectors important to the state’s economy;

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<sup>5</sup> The program’s request for proposals for FY1998 and FY1999 said: “Proposed initiative should have the capacity for generating substantial economic growth in the State of Ohio and for creating and/or retaining sustainable jobs.” Similarly, the FY2000 request said: “Proposed initiatives should have the capacity for creating wealth and substantial economic growth in Ohio by fostering growth in high-technology. More consideration will be given to proposals that state the economic benefit in Ohio in detail.” (p. 2) For more detail on the current requirements, see below.

<sup>6</sup> H.B. 215 from the 122<sup>nd</sup> General Assembly said that the \$3 million appropriation for fiscal 1998 and 1999 was to be used “to match funding for high priority technology initiatives that will make Ohio entities more competitive in federal research and development programs. Guidelines and criteria for the release of funds shall be developed by the Governor’s Science Advisor to assure support for projects that advance the state’s science and technology priorities, general potential economic growth, and leverage other financing sources.” (Section 47.07)

<sup>7</sup> Another \$2.7 million awarded separately in FY03 for three fuel-cell public demonstration projects is not included in these totals.

- (4) Build strong partnerships between industry, universities, non-profit corporations and federal laboratories within the state; or
- (5) Facilitate the formation and growth of high technology companies in the state.”<sup>8</sup>

The grants, which are awarded through a competition, now focus on three areas: Early-stage capital for start-up or young technology companies;<sup>9</sup> collaborations to commercialize “a near-term specific or platform technology or capability,” and Gov. Taft’s Fuel Cell Initiative. Both technology-commercialization and fuel-cell proposals must include any mix of two or more independent firms, universities, or not-for-profit or governmental research institutes.

Grants typically are to be no more than 10 percent of the total funds available to be awarded that year, or roughly \$1.5 million at most. Those for early-stage capital and technology commercialization projects are for at least \$100,000, while fuel-cell projects typically are at least \$500,000.<sup>10</sup>

Applicants must be based in or have a significant presence in Ohio, or be committed to having a headquarters or significant presence in the state in the future. “A substantial portion of the project and the benefit of the project must occur in Ohio,”<sup>11</sup> says the most recent request for proposals (RFP). Applicants must explain why TFAF support is needed, and why their projects will not move forward without TFAF support.<sup>12</sup>

The program is administered by the Technology Division of the Ohio Department of Development. It uses two outside contractors to evaluate grant proposals, which make recommendations after a two-stage review process. The Third Frontier Commission, which includes the director of the Department of Development, the chancellor of the Board of Regents, and the governor’s science and technology adviser, hears those recommendations and makes TFAF grants. A 14-member advisory board provides guidance and advice. The commission was created by the legislature in an act last year; until July, when the commission first met, TFAF grants were overseen by the Technology

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<sup>8</sup> Ohio Administrative Code, Section 122:14-1-01. These rules are no longer in force, according to the Department of Development, and will be rescinded with the change in governance that established the Third Frontier Commission (Ohio Department of Development, Response to questions by Policy Matters Ohio, Oct. 24, 2003 and Dec. 3, 2003). The department did not say whether they would be replaced.

<sup>9</sup> Proposals to increase the availability of professionally managed, early-stage capital fall into three sub-categories: Organizing an early-stage investment fund, capitalizing an early-stage fund, or creating and capitalizing a technology validation fund.

<sup>10</sup> Third Frontier Action Fund, 2004 Request for Proposals, p. 6. Grant maximums have varied during the course of the program, but have generally been between \$1 million and \$1.5 million for the last several years.

<sup>11</sup> Third Frontier Action Fund 2004 RFP, p. 5. Applicants from outside Ohio must commit to moving to the state or creating a significant presence in Ohio as a condition of the award. See Part IV for more discussion about requirements for Ohio benefits.

<sup>12</sup> Ibid, pp.14-16.

Action Board, a 14-member panel appointed by the governor.<sup>13</sup> Before, as now, the State Controlling Board gives final approval to funding for the grants.

The fund has had three phases, notes Frank Samuel, Gov. Taft's science adviser, who also chaired the board that oversaw the program until recently.<sup>14</sup> First, it was a small fund backing research programs in order to match federal research dollars and bring more money into the state. In fiscal 1998, its first year, just \$1 million was spent on three grants, most of that for the Glennan Microsystems Initiative, which aimed to research and commercialize tiny sensors and other devices that can function in harsh environments. In fiscal 2000, grant awards grew to nearly \$15 million, and the state began funding a much wider variety of projects. The focus: Supporting entrepreneurial activity in technology sectors in the state.<sup>15</sup> Samuel calls this second phase "building infrastructure." The program added more extensive requirements as it continued. Grant awards slipped below \$12 million a year in fiscal 2002 and 2003, but increased again to \$13 million in FY2004.<sup>16</sup> Beginning in fiscal 2002, the program was narrowed to fund commercialization of near-term technologies into products, and early-stage capital for start-up or young companies (In fiscal 2003, the governor's fuel cell initiative was added as a third focus area).<sup>17</sup>

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<sup>13</sup> Originally, the Governor's Science and Technology Council established guidelines for the allocation of funds, and the science adviser managed the account. The Technology Action Board took over later. The Catalog of Budget Line Items, Legislative Service Commission, October, 2003, p. 162.

<sup>14</sup> Interview with Frank Samuel and Norman L. Chagnon, staff director, Third Frontier Commission, Aug. 12, 2003.

<sup>15</sup>Section 37.05, H.B 283, 123<sup>rd</sup> General Assembly, stated that, "Grant proposals shall be evaluated on, but not limited to, the following criteria: (1) Applicants are leveraging federal and industrial support; (2) The potential return on investment to the economy of the state; (3) Projects are able to become independent of state funds within a short time period; and (4) Focus on regional or statewide clusters of technology strength or needs." Initiatives to be considered ranged from those providing information to prospective entrepreneurs on starting technology companies and support sources for that to "Building clusters of technology which bring together entrepreneurs with common needs and activities to enhance their productivity." Among the others were forming a seed fund and accelerating development needed to start a new technology company. Technology Action Fund, Request for Full Proposals 2000-2001, revised February 26, 2000, p. 1.

<sup>16</sup> Response to questions by Policy Matters Ohio, Ohio Department of Development, Dec. 3, 2003. Amounts actually spent may have varied slightly based on later budget modifications. State budgets as originally approved by the General Assembly included funding for the program of \$61.2 million between FY1998 and FY2003 (see HB 215, 122<sup>nd</sup> General Assembly; HB 283, 123<sup>rd</sup> G.A. and HB 94, 124<sup>th</sup> G.A.). In FY2004 and FY2005, the General Assembly has appropriated \$16.79 million a year. (Budget in Detail, Amended Substitute House Bill 95, 125<sup>th</sup> G.A., Main Operating Appropriations Bill (FY2004-2005), Legislative Service Commission, July 31, 2003, p. 25). Not all of these amounts actually is spent on the grants themselves.

<sup>17</sup> The program's changing focus was spelled out in the FY2003 Request for Proposals, which said: "Originally, the TAF was used to increase the amount of federal research dollars coming into Ohio by providing matching funds in research proposals to federal agencies. "In the 2000 and 2001 funding cycles the Technology Action Board focused the purpose of the Fund to support entrepreneurial activity in technology sectors in Ohio. "In the 2002 funding cycle the board designated two targets of the RFP. One Focus Area was to increase the availability of professionally managed, early-stage capital to Ohio start-up or early-stage technology companies. A second Focus Area provided support for collaborations formed between private companies and eligible not-for-profit research institutions to commercialize a near-term specific or platform

It is impossible to fully analyze the successes and failures, and what lay behind them, of all 80 grants. A recent *Akron Beacon Journal* examination of one project, the Ohio Polymer Enterprise Development Initiative (OPED), found that different players offered different explanations for its failure. The University of Akron won two TFAF grants totaling \$1.96 million over three years for the initiative.<sup>18</sup> Some OPED officials blame the University of Akron, the newspaper reported, saying it gave only lip service to promises of cooperation and failed to quickly reimburse the group for expenses. It continued: “The university, for its part, blames the state for pulling the plug before OPED had a chance to really get going. And the state blames OPED for not working faster and harder to find other sources of money. Meanwhile, outside business leaders say the effort, which seemed to generate excitement and some early success, was shut down before it had a chance to succeed.”<sup>19</sup>

Though the whys and wherefores of each grant may sometimes be obscure, it is possible to review the overall data, explore some grants and review the program’s results. The average TFAF grant has amounted to nearly \$690,000. Table 1 lists those grants totaling \$1 million and above between Fiscal 1998 and Fiscal 2003.<sup>20</sup>

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technology or capability. Those two Focus Areas are continued in this RFP and a third Focus Area is being added in support of the Governor’s Fuel Cell Initiative.”

<sup>18</sup>TECH 00-102 University of Akron, Advanced Polymer Enterprise Development Initiative, and TECH 01-053 University of Akron, Ohio Polymer Enterprise Development Initiative, TAF 2001 Proposal. OPED discontinued its operations earlier this year. See TECH 01-053.

<sup>19</sup> “OPED’s Demise a Game of Blame,” John Russell, *The Akron Beacon Journal*, Aug. 17, 2003. The article noted that, “It helped eight companies set up shop in Northeast Ohio, several of them at the Akron Industrial Incubator. But together, all those companies have only about 25 jobs, and several of them are struggling to find funding. On the other hand, OPED got the area talking about ways to commercialize polymers and got people connected -- two functions that seemed to be lacking before.”

<sup>20</sup> Some basic information on FY2004 grants that were approved by the Third Frontier Commission in October has been made available through press releases. However, these grants have not yet been approved by the State Controlling Board, and the Department of Development has not provided Policy Matters Ohio with details as disclosed at the Third Frontier Commission meeting. Thus, FY2004 grants are not included in this table or the charts below.

Table 1: Third Frontier Action Fund Grants Worth \$1,000,000 or More, FY1998-2003

Grantee(s)	Project Title	Amount	Fiscal Year
BIOMECC, Inc.	Accelerated Commercialization of Biomedical Technology	\$1,875,000	2000
Columbus Technology Leadership Council	Reservoir Venture Partners, LP [formerly Columbus Emerging Technology Fund]	\$1,625,000	2001
ESP Holdings, LLC	Early Stage Partners LP	\$1,625,000	2001
Quark Biotech, Inc.	QBI-CCF Initiative for Gene-Based Pharmaceutical Development	\$1,575,000	2001
Science and Technology Campus Corporation	The Ohio MicroMD Laboratory at the Science and Technology Campus of the Ohio State University & iMEDD, Inc.	\$1,500,000	2000
University of Akron	Ohio Polymer Enterprise Development Initiative	\$1,500,000	2001
Battelle Memorial Institute	Glennan Microsystems Initiative	\$1,300,000	2000
OSU Research Foundation	ITEC (Internet2 Technology Evaluation Center) – Ohio	\$1,300,000	2000
Battelle Memorial Institute *	Glennan Microsystems Initiative	\$1,150,000	2001
Ohio Innovation Fund II, LP	Ohio Innovation Fund II, LP	\$1,150,000	2002
AlphaMicron, Inc.	Liquid Crystal Eyewear	\$1,148,766	2002
Science and Technology Campus Corporation	1st Fifty Validation Fund	\$1,100,000	2002
Copernicus Therapeutics, Inc.	Pulmonary Gene Transfer: Aerosol Development	\$1,085,164	2002
Cleveland Clinic Foundation	NovaMedics Technology Validation Fund	\$1,080,000	2003
Cleveland Clinic Foundation	MEMS Technology Platform for Implantable Medical Applications	\$1,050,000	2001
Battelle Memorial Institute	Southeastern Ohio Science and Technology Commercialization Initiative	\$1,000,000	2001
Edison BioTechnology Center, Inc.	BioEnterprise Corporation [formerly Cleveland Biotechnology Park]	\$1,000,000	2001
The Entrepreneurs Fund, LLC	E-Fund Capitalization Project	\$1,000,000	2002
Viztec, Inc.	Commercialization of Plastic Liquid Crystal Displays	\$1,000,000	2002

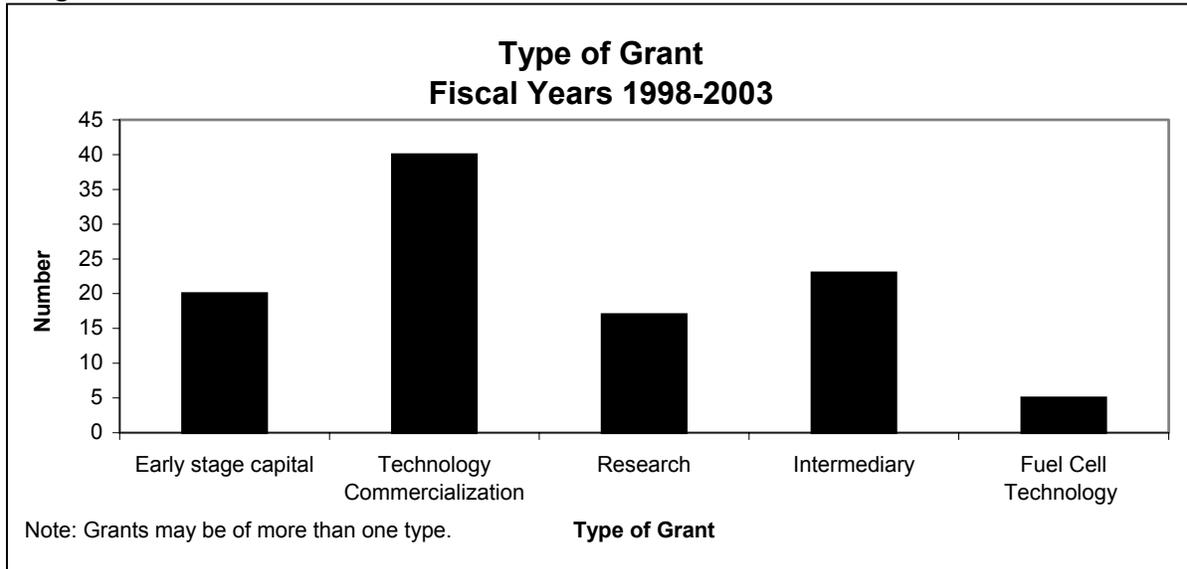
\* The term of this grant was extended in FY2002 and another \$1.15 million was added.  
Source: Policy Matters Ohio analysis of Ohio Department of Development data

The grants fall into one or more of five categories: Technology Commercialization, Early Stage Capital (to make funds available for start-up enterprises), Intermediary (for the usually non-profit entities that try to boost technology-based firms), Research and Fuel Cell.\* The number of grants for research fell after FY1999, and with the second change in focus of the program beginning in FY2002, few intermediaries have received grants. On the other hand, technology commercialization grants have been awarded throughout the course of the TFAF program, accounting for half of the grants altogether.<sup>21</sup> Figure 1 outlines how many grants fall into each category:

\* These categories include three that have been used recently by the state – early stage capital, technology commercialization and fuel cell – as well as two others included by Policy Matters that largely cover grants given in earlier years.

<sup>21</sup> As noted above, these totals include grants from between FY1998 and FY2003. For FY2004, the Third Frontier Commission has approved two early stage capital grants, nine for technology commercialization, and three for fuel cell projects. See news releases at <http://www.connectohio.com/3rdfrontier/> Between 13

Figure 1



Source: Policy Matters Ohio analysis of ODOD data

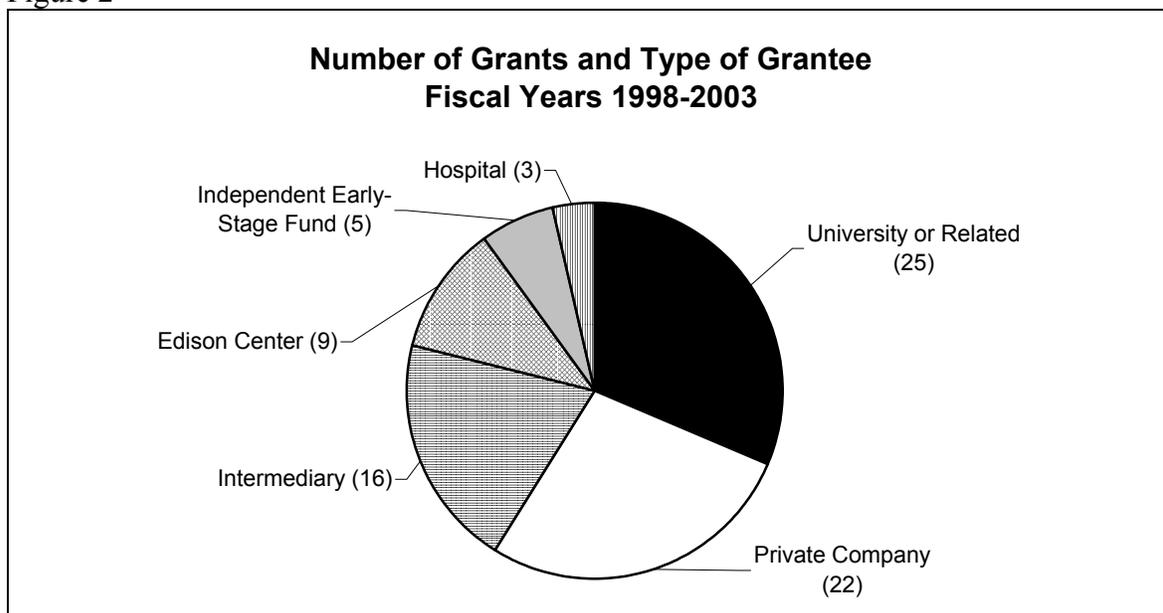
Between FY1998 and FY2003, the largest single number of grants – 25 – went to universities or related entities. However, most of those were given in earlier years; recently, universities have received few, and most grants have gone to private companies. Private firms received 22 grants between FY2000, when the program was expanded, and FY2003.<sup>22</sup> Intermediaries such as chambers of commerce and nonprofits aimed at sparking regional high-tech development, together with the state’s Thomas Edison centers, which also function in that fashion, account for most of the rest during the course of the program. Figure 2 depicts the breakdown.

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and 17 grants have been awarded in each of the last four fiscal years, including FY2004; the number of grants peaked in FY2000 at 26.

<sup>22</sup> This trend continued in FY2004, when private companies received twelve grants of the fourteen approved; an intermediary and an independent early-stage fund received the others. See news releases at <http://www.connectohio.com/3rdfrontier/>

Figure 2



Source: Policy Matters Ohio analysis of ODOD data

For several years, applicants for TFAF grants have had to include collaborators if they were seeking funds to commercialize new technologies.<sup>23</sup> Private companies and not-for-profit research institutions were required to collaborate. However, this requirement has changed recently. Starting in FY2004, these collaborations no longer needed to be between private companies and nonprofits, but could be among any two independent firms, universities, or eligible not-for-profit or government research institutes.<sup>24</sup> Thus, there has been a de-emphasis of technology transfer from the not-for-profit sector to commercial industry. While many FY04 commercialization grants involve collaborations between private companies and universities, others do not.<sup>25</sup>

The TFAF program always has required matching monies from others. At the program's outset five years ago when its biggest aim was attracting federal grant money, grantees had to match each dollar of TAF money with \$3 in federal money and another \$1 in industry support.<sup>26</sup> Now, with one major exception, the required matching funds are not as great. Grants for technology commercialization and fuel cells mandate \$1 in cost

<sup>23</sup> This requirement extends also to those seeking fuel-cell grants, but not to those applying for support of early-stage capital efforts. Collaboration between academia, industry and government has been encouraged since the beginning of the program.

<sup>24</sup> Third Frontier Action Fund, 2004 Request for Proposals, p. 8. This requirement was similarly relaxed in FY2003 in the case of fuel-cell applicants.

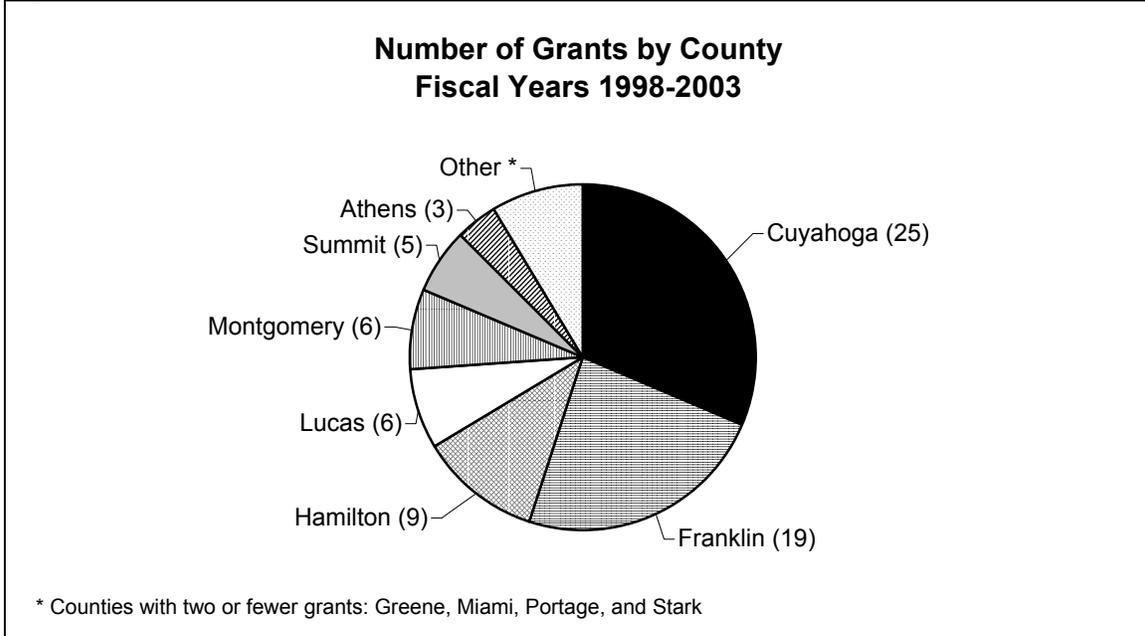
<sup>25</sup> See news releases at <http://www.connectohio.com/3rdfrontier/>

<sup>26</sup> Interview with Will Vaughan, business development manager at Ohio State University's Office for Technology Partnerships and previously manager for the Governor's Office of Science and Technology, Sept. 30, 2003.

sharing for each \$2 provided by TFAF. However, those grants used to capitalize an early-stage investment fund require outsiders to put up \$15 for every TFAF \$1.<sup>27</sup>

Most TFAF grants have gone to Cuyahoga or Franklin counties, as Figure 3 illustrates.<sup>28</sup> Altogether, grants were given in a total of 11 of Ohio’s 88 counties through FY2003:

Figure 3



Source: Policy Matters Ohio analysis of ODOD data

### III How the Third Frontier Action Fund has performed

The largest recipient of TFAF money since the program began -- \$4.8 million altogether in four grants over more than five years – is the Glennan Microsystems Initiative. It was established in June 1998, by NASA and its Glenn Research Center in Cleveland, the State of Ohio and Case Western Reserve University. The five-year public/private partnership, as it later described itself, “develops, applies and commercializes microsystems technologies for harsh environments. This initiative integrates and augments substantial microsystems resources that currently exist within the State, focuses them on areas of

<sup>27</sup> The other early-stage capital grants have different requirements. Grants for organizing a fund must be matched \$1 for \$1. Those used for technology validation must put up \$1 for each \$2 TFAF provides. 2004 Third Frontier Action Fund RFP, p. 10.

<sup>28</sup> Grants for the Glennan Microsystems Initiative have been classified as Cuyahoga County grants because the project was based there, though the grantee was Battelle Memorial Institute in Franklin County. The pattern in Figure 3 continued with FY2004 grants, which included five in Cuyahoga County, four in Franklin, two in Lucas, two in Hamilton and one in Hancock. Including these grants, a total of twelve Ohio counties had received them during the course of the program.

industrial importance and bridges key, critical gaps to commercialization through strategic investments.”<sup>29</sup>

The Technology Action Fund was initially created for Glennan, and it accounted for \$715,000 of the \$1 million spent on the program in its first year. The initiative is managed by Battelle Memorial Institute, which does technology transfer for NASA Glenn, and aims to support NASA’s mission in addition to its industrial and commercial goals.

Glennan clearly has succeeded in drawing more funds for research, development and commercialization of microsystems technology. Walter Merrill, the executive director, said that altogether, the initiative has leveraged another \$35 million in support, including \$16.5 million in matching monies from NASA, about \$10 million from other private and federal sources, and \$8 million federal in-kind support.<sup>30</sup> Staff was paid with the state funds. “It would be a very, very different kind of activity if we didn’t have the state money,” Merrill said. With that support, there was a focus on commercialization that otherwise would not have existed, he said.

Indeed, this was not simply a research project leveraging federal dollars. An Ohio Department of Development description of the project states: “As a result of this initiative, Ohio will experience meaningful job growth, receive substantial new revenues, attract high technology workers, be recognized for the design, manufacture, and use of microsystems and successfully compete for jobs.”<sup>31</sup>

Glennan has supported the development of a one-of-a-kind manufacturing process for making tiny devices out of silicon carbide, which is now being used by some universities and major private companies to test prototype designs.<sup>32</sup> According to Merrill, Glennan’s backing was critical to the start-up or continued existence of four companies, including the operator of that process. Another one that it helped with a market analysis and business plan was H-Cubed Inc. of Research Triangle Park, N.C., a start-up led by veterans of the microsystems business that wants to relocate to Cleveland.<sup>33</sup> H-Cubed has been working with Cleveland Clinic researchers to develop several medical microsystems technologies, including two catheter-based devices that would take tiny images within veins and arteries, and inject therapeutic drugs there to destroy undesirable plaques.<sup>34</sup>

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<sup>29</sup> The Glennan Microsystems Initiative, Final Report to the State of Ohio, Technology Action Fund Grant Number 99-059, p 3.

<sup>30</sup> Interview with Walter Merrill, September 15, 2003. Overall during its first two years, the Technology Action Fund far exceeded its requirements in drawing federal and industrial matching dollars, according to Will Vaughan.

<sup>31</sup> Synopsis of Projects Funded – 2002 Technology Action Fund, Ohio Department of Development.

<sup>32</sup> That process has been used by eleven companies, fifteen universities and five government labs, according to a performance summary Merrill produced (TAF Performance Report, Glennan Microsystems Initiative).

<sup>33</sup> Interviews with Merrill, Sept. 15, 2003, and Vijay Dhuler, president and CEO, H-Cubed Inc., Nov. 14, 2003.

<sup>34</sup> Glennan funding helped support research at the Cleveland Clinic on these two technologies. “Without it, we’d be nowhere near as far along as we are now,” said Elizabeth Sump, licensing manager for the Clinic’s technology transfer office, CCF Innovations Inc. H-Cubed and the Clinic are discussing partnership

Glennan has moved products closer to commercialization. It set as an objective to do so with three different product “platforms,” a high temperature pressure sensor, a chemical sensor, and the catheter-based drug delivery system. “By most metrics, we’ve met that goal,” said Merrill. Besides the possibility that the drug-delivery system might be produced in Cleveland, for instance, one California company Glennan has worked with may set up a manufacturing operation in Ohio to make chemical sensors. The initiative also has elevated the region’s stature in microsystems, Merrill said.

Summarizing the signs of movement toward commercial development of technologies it worked on, Merrill said: “We’re getting some men on base, with a couple of batters coming up and a chance to score some runs.” He believes Glennan has been very successful and that that success “is directly attributable to TAF support.”

On the other hand, Glennan’s ongoing contribution to the area’s commercial economy is not large. Though there have been as many start-up companies as Glennan promised, the start-up operations it has worked with closely had just 19 jobs last year, some of which have probably since been eliminated.<sup>35</sup> Revenues from microsystems, which were supposed to be “substantial” as a result of the initiative,<sup>36</sup> are still mostly a matter of potential.<sup>37</sup>

Though it has moved products closer to the market, Glennan has not actually commercialized any new microsystems product yet, which was another one of its specific goals. Merrill noted there was some naivete in thinking that new technology could be commercialized in just the span of the Glennan initiative. “It takes longer than five years to take high technology and commercialize it,” he said.

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opportunities, and H-Cubed could get the manufacturing rights to these technologies, according to Sump. “It’s our goal to give them no excuse not to have all their operations here,” she said. However, more work still must be done – and money must be found to do it – to further develop the technologies and bring them to the point of they can be readily manufactured. H-Cubed was unsuccessful in attempting to win TFAF funds in the latest competition. Interviews with Elizabeth Sump, Nov. 18 and Dec. 1, 2003. Clinic researchers also have a separate TFAF grant to develop technology for wireless monitoring of body conditions through tiny sensors (TECH 01-060 The Cleveland Clinic Foundation, MEMS Technology Platform for Implantable Medical Applications, Ohio TAF – Quarterly Report, June 30, 2003). However, Sump said that the two catheter-based technologies are closer to the market.

<sup>35</sup> Obviously, other jobs have been created or supported through Glennan’s research. For instance, NASA’s \$8 million in-kind contributions included 8 to 10 people a year working on the program, Merrill said.

<sup>36</sup> Synopsis of Projects Funded – 2002 Technology Action Fund.

<sup>37</sup> For instance, according to business plan projections, in three to five years the “MUSiC” (for Multi-User Silicon Carbide) manufacturing process will generate \$800,000 in revenues, and the company that operates it, FLX Micro, will have revenues in the \$15 million to \$50 million range in five years. In seven years, H-Cubed expects a \$12 million market with seven new employees, including \$400,000 a year in support from the National Institutes of Health due to partnership with the Glennan initiative. In five years, the chemical sensors business will grow to \$50 million to \$100 million. These projections, based on business plans of the relevant collaborators, were cited in the summary Merrill produced (TAF Performance Report, Glennan Microsystems Initiative). The summary also noted, among other things, that over 100 research papers have been published and 20 patents or disclosures have been filed because of the initiative, and that NASA accelerated several milestones by two years.

If Glennan is just getting some traction, it clearly needed more than five years to achieve the kind of economic benefits it hoped to achieve. Glennan is more far-reaching and ambitious than many other projects and has its own unique features, such as the competing interest of the NASA mission. Still, if this is true of Glennan, the TFAF grantee that has received the largest and most long-lasting support, it suggests that major economic benefits from TFAF commercialization projects won't come quickly.

### **Science and Technology Campus Corp.**

Another major recipient of program grants has been Science and Technology Campus Corp., a three-pronged effort that includes a research park on the Ohio State University campus, commercialization of new technologies and early-stage capital funds. Since it started up five years ago, Scitech has become a home for 237 full-time equivalent jobs, excluding Honda researchers who also occupy some of its space. According to the Department of Development, Scitech has been awarded five grants for a total of nearly \$2.5 million, including a \$100,000 earmark by the General Assembly for each of two years to fund basic operations.<sup>38</sup> Besides that, it received \$832,500 for a technology commercialization initiative aimed at creating new high-technology companies, \$350,000 for a technology validation fund targeted at research at the OSU College of Engineering and most recently, in FY2002, \$1.1 million for its First Fifty Validation Fund, a Central Ohio “preseed” fund that invests in very early stage business development. Scitech, an independent non-profit affiliated with OSU, has been the third-largest recipient of TAF grants, by dollar volume.<sup>39</sup>

Scitech has been backed not just by the state, but by the city of Columbus and Ohio State University; the three together have invested \$6 million.<sup>40</sup> “The TAF money was helpful in getting the research park up and going. It was absolutely critical in getting the commercialization and early stage capital going,” said Ora Smith, Scitech president and CEO. “We had no other source of capital.”<sup>41</sup>

Scitech helped form or invested in six companies through the technology commercialization initiative during the course of that grant.<sup>42</sup> Altogether, its venture-capital operations have invested \$1.2 million in a dozen companies, attracting \$23 million

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<sup>38</sup> The General Assembly also earmarked \$250,000 in fiscal 2000 to the Miami Valley Economic Development Coalition for a strategic competitive study for Wright Patterson Air Force Base.

<sup>39</sup> The second-largest recipient, with seven grants worth a total of \$3 million, has been Ohio State University Research Foundation. That is as one might expect, given that OSU is the flagship state university with the largest research effort. Four of these grants, totaling nearly \$1 million, were made during the first two years of the program. Other projects receiving grants included a shared software test and development facility, a second-generation Internet test and evaluation center and support for a start-up company with novel drug-delivery technology (see below).

<sup>40</sup> Interview with Mark Butterworth, executive vice president of Scitech, Nov. 10, 2003. Including public funds allotted but not yet spent and earmarked for expansion of the Business Technology Center, the total comes to \$8.9 million, he said. That amount does not include pass-through grants to others.

<sup>41</sup> Interview with Ora Smith, Sept. 25, 2003.

<sup>42</sup> TECH 00-093, Science and Technology Campus Corporation, Technology Commercialization Initiative, Technology Action Fund Final Progress Report, Period: July 1, 2002 – Sept. 30, 2002.

from other investors and about \$6 million in federal and state grants.<sup>43</sup> Smith said Scitech currently has 44 tenants, including companies that are tenants of the Business Technology Center, an independently run incubator that Scitech houses and works with closely. The state and city have collected \$3.8 million in income taxes paid by workers at Scitech so far. Based on its long-term plan, Scitech projects that by 2024 it will return \$4 to the state in personal income taxes for each \$1 the state invests in it, or a 41 percent compound annual rate of return.<sup>44</sup> “We’ve accomplished a tremendous amount,” said Smith. Frank Samuel, though not singling Scitech out, said: “It seems to me that it’s got all the right pieces assembled in one place.”<sup>45</sup>

The achievement needs to be kept in perspective. Scitech’s proposal in 2000 stated: “It is important to note that the Technology Commercialization Initiative will focus its efforts on “home run” business development opportunities with potential for major economic impact.”<sup>46</sup> In relation to the larger economy, Scitech’s contribution remains peanut-sized, Smith readily acknowledges. “The next stage – the thing we need to focus attention on now is that some of these little companies grow to be big companies... We seem to have found a formula to get them some revenue, up to 20 or 30 people...How do you get them to 200 or 300 people, and serious profitability...How do we create a business process to get up to that.”<sup>47</sup>

### **Job creation**

Smith might have been speaking of other such efforts, too. Many grantees have not aimed directly at creating new positions, and others could yet grow and develop into more substantial employers. But so far, the Third Frontier Action Fund has not been a big job creator.

At least 25 of the 52 grantees that received awards prior to fiscal 2003 included jobs among the goals they told to the Department of Development.<sup>48</sup> Determining the exact number of jobs created by TFAF grantees is often difficult because that is not automatically reported even by those that have listed job creation as a goal. In other

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<sup>43</sup> Interview with Ora Smith, Sept. 25, 2003. Scitech has not been successful in winning TFAF funding to help pay the staff of its early-stage capital operations, however. Mark Butterworth, executive vice president of Scitech, said that the nonprofit would seek other sources to fund that, but would not be able to rely indefinitely on funds from the real estate arm. Scitech leases 53 acres from Ohio State University for \$1 a year, allowing it to offer tenants lower rents and flexible terms, and lease to companies that might not otherwise be able to get one. Interview with Butterworth, Dec. 5, 2003.

<sup>44</sup> The projection is based on personal income taxes the state will receive if Scitech grows according to its Five Year Master Site Plan. It includes state support for Scitech and BTC, but does not include any state aid to companies housed at Scitech. If Scitech expands its employment to 349 based on construction currently under way and retains that number of jobs through 2024, the return would be \$2 for each \$1 the state invests, or a 21 percent compound annual return. Ora Smith, Letter to Frank Samuel, June 23, 2003, and interview with Mark Butterworth, Dec. 5, 2003.

<sup>45</sup> Interview with Frank Samuel, Sept. 24, 2003.

<sup>46</sup> TECH00-093 Science & Technology Campus Corp., Technology Commercialization Initiative, Exhibit 1, Scope of Work and Work Plan – Technology Action Fund, p. 3.

<sup>47</sup> Interview with Ora Smith, Sept. 25, 2003.

<sup>48</sup> More than half of these 25 cited no specific number as a goal. Five aimed to create 100 or more jobs long-term. Two of these have failed, one has succeeded, and with two it’s too soon to tell.

instances, the grant program may play a role in job creation by others. For instance, the Entrepreneurs Fund, a TFAF grantee, reported in July that 36 jobs had been created at Construction Software Technologies Inc. of suburban Cincinnati since it invested in the company in August, 2002.<sup>49</sup> The company, whose web site iSqFt provides online construction information, has grown to have nearly 100 employees. President Dave Conway said in an interview that the fund's backing has been quite meaningful, allowing the company to add employees and invest in technology.<sup>50</sup>

Altogether, 14 of the 25 grantees that promised jobs said in a recent report that some have been created. According to quarterly reports filed through mid-August with the Ohio Department of Development, the most significant creators of new jobs besides Scitech included the following:

- Training in cleanroom techniques supported by a grant to Kent State University helped one company improve its product quality and cost, making it possible to keep 45 jobs in Ohio and create between 3 and 15 more. Three other companies said they used the program to help develop new operations that are associated with 30 new jobs, though it can't be seen as a direct cause. Others are achieving efficiency gains that an outside expert estimates to add 4 new jobs. On the other hand, 95 of the total of 238 people trained through the program were from Crystaloid Technologies Inc., a company that was purchased by DCI Incorporated and closed its Ohio facility in December, 2002.<sup>51</sup>
- Companies backed by Main Street Ventures, an incubator and supporter of high-tech enterprises in Cincinnati's Over the Rhine neighborhood, created 336 jobs, "far outpacing the objective of 100 for the plan period," according to MSV's final report last spring.<sup>52</sup> "With the contraction of the tech sector over the last 24 months, the current number of jobs remains at approximately 200," it said.
- Diagnostic Hybrids Inc., an Athens company that sells cell cultures used for diagnostic tests, expanded employment by 13 or 14 jobs as a collaborator on a grant received by Ohio University's Edison Biotechnology Institute.<sup>53</sup> Altogether, DHI's employment has surged from 45 in 2000 to 108 now. The grant helped bring about the commercialization of two new diagnostic technologies. The institute

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<sup>49</sup> TECH 02-073 The Entrepreneurs Fund, LLC, E-Fund Capitalization Project, TAF Quarterly Status Report, July 10, 2003, p. 2.

<sup>50</sup> Interview with Dave Conway, president of Construction Software Technologies Inc., Nov. 4, 2003.

<sup>51</sup> TECH 00-098 Kent State University / College of Continuing Studies, Basic Cleanroom Techniques and Related Technical Training, June 1, 2000 – June 30, 2003, Final Report. Information is from attached report, "Economic Impacts Associated with Kent State University's Basic Cleanroom Techniques Training," Dr. Robert Hines, Tech Resources Inc., April 30, 2003.

<sup>52</sup> TECH 00-100 Main Street Ventures, MSV Incubator, Final Report, January 1, 2003 through March 31, 2003.

<sup>53</sup> Interview with David R. Scholl, president and CEO, Diagnostic Hybrids Inc., Dec. 3, 2003.

boasted in its report of “near total success in 2 years, 3 years ahead of schedule!” (See below)<sup>54</sup>

Besides those cited above, other grantees reported creation of 51 new jobs in total, including four part-time positions. Twenty two of those positions were at Quark Biotech or Viztec Inc., which have indicated they will be eliminating most or all of their Ohio positions. These figures cover those that were cited by grantees in their quarterly reports to the Department of Development; in a few instances, such as Glennan, interviews with grantees revealed other positions that had been created.<sup>55</sup> While an exact accounting of how many jobs have been created by TFAF grantees is impossible, it seems clear that they number in the hundreds, as opposed to the thousands. This performance is in keeping with a much-praised program in Georgia to capitalize on university research to build a vibrant economy. According to the *Dayton Daily News*, the Georgia Research Alliance has helped generate more than 3,000 technology jobs since 1990.<sup>56</sup>

### **Was TAF money needed**

“The intent of TFAF is to fund activity that would not have otherwise gone forward,” said the request for proposals for fiscal 2004.<sup>57</sup> Applicants also are asked to address why their projects will not move forward without TFAF support, and their answers are one criterion used to judge the proposals.<sup>58</sup>

Sometimes, grantees have reported the grant was an important ingredient in their progress. For instance, WebCore Technologies Inc., which received a \$750,000 grant to help develop a production process for making fiber reinforced foam composite materials and qualify such products for commercial use, said in its final report that the TAF grant had enabled it “to start production of FRF products considerably sooner than had it not received the award. The timing was important, because it enabled the transition to production and establishes expanded operations here in Ohio.”<sup>59</sup> However, it is often difficult to discern how much of a role TFAF has played. For instance, a TFAF grant may be only a small portion of a fund investing in a young company, and then that investment may be one of a number of investors.

### **Technology commercialization**

The development department looks for technology commercialization projects with the greatest potential impact with moderate to moderately high risk, said Robert H. Garrick,

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<sup>54</sup> TECH 00-096 Ohio University Edison Biotechnology Institute, Ohio University Biotechnology Senior Research Scientist Project, TAF report, April 7, 2003 (Final Report), p. 1.

<sup>55</sup> For instance, AlphaMicron Inc., a company in Kent, has increased its staff from one half-time person five years ago to 17. The company is receiving a two-year, \$1,148,766 grant to help commercialize liquid crystal eyewear that would change its tint at the touch of a finger. Interview with Bahman Taheri, CEO of AlphaMicron Inc., Oct. 3, 2003.

<sup>56</sup> William Hershey, *The Dayton Daily News*, “Ohio has much to learn from Georgia research program,” Oct. 12, 2003.

<sup>57</sup> Third Frontier Action Fund 2004 Request for Proposals, p. 8.

<sup>58</sup> *Ibid*, pp. 14, 18-20.

<sup>59</sup> TECH 01-059 WebCore Technologies Inc., Low Cost Composites Manufacturing, TAF Final Report, October 4, 2002, p.3.

manager of grants administration for the ODOD Technology Division, in an interview.<sup>60</sup> High-risk projects are better supported by the federal government, he said, while low-risk ones will be done by the private sector on its own. ODOD is looking for platform technology and platform capability, Garrick said, “something with an impact beyond just a single company, though definitely it will impact that company...We’re looking for something with an noticeable ripple effect...” The department also is looking for technologies that can be commercialized within five years.<sup>61</sup>

Diagnostic Hybrids Inc. and Leonard D. Kohn achieved that well within the time period, helped by the grant to OU’s Edison Biotechnology Institute.<sup>62</sup> With the grant, OU brought Kohn to the institute from the National Institutes of Health outside Washington, D.C. Kohn already had a working relationship with DHI. “We exploited the opportunity to work closer together on something that already was working well,” said David R. Scholl, DHI’s president and CEO.<sup>63</sup> The short-term result was two new technologies developed by Kohn and DHI, and licensed by Kohn’s company Interthyr Corp. to DHI, which makes and distributes the products. One is a much improved test for patients with Graves’ Disease, while the other is a platform technology that allows previously frozen cells to be used to diagnose herpes, respiratory and other viruses. This year, they will account for about 13 percent of DHI’s revenues, which have been growing rapidly. Scholl projects that sales growth over the next five years could produce between 35 and 140 additional new jobs. DHI also bought a couple of its out-of-state competitors last year, boosting sales and increasing Ohio employment by another two dozen.

However, few other products have been commercialized yet that involved TFAF grants. In many instances, of course, the process has only been going a year or two, so it’s hardly reasonable to think that should already have happened. In some cases, companies seem to be making headway. For example, Imalux Corp., a Cleveland company that received a \$542,000 TFAF award to help develop a new medical-imaging technology for early cancer detection, expects to file this year with the Food & Drug Administration for clearance to sell the device. It has hired an experienced manager, raised funds from other investors – including TFAF early-stage capital recipients such as Early Stage Partners LP and Reservoir Venture Partners LP – and is employing Biomec Inc., another TFAF grantee, to make the product.<sup>64</sup>

Trevor O. Jones, chairman and CEO of Biomec, points out that in high technology, “There are going to be a lot of failures and few successes.”<sup>65</sup> That’s simply the nature of

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<sup>60</sup> Interview with Robert Garrick and Norm Chagnon, July 17, 2003.

<sup>61</sup> Fuel cell projects are not covered by this criterion.

<sup>62</sup> The grant also had other, longer-term goals for research and commercialization. TECH 00-096, Ohio University Edison Biotechnology Institute, Ohio University Biotechnology Senior Research Scientist Project, Exhibit 1, Scope of Work.

<sup>63</sup> Interview with David R. Scholl, Dec. 3, 2003.

<sup>64</sup> TECH 02-072, Imalux Corporation, Development of Optical Coherence Tomography in Management of Cervical and Vulvar Cancer, Technology Action Fund Quarterly Report, April – June, 2003; “Investors’ cash has Imalux set to move forward,” Shasta Clark, *Crain’s Cleveland Business*, Sept. 22, 2003, and <http://imalux.com/index.htm>

<sup>65</sup> Interview with Trevor O. Jones, Sept. 22, 2003.

such business, regardless of whether funding comes from the private or public sector. Jones and others like him argue that Midwesterners need to get over the fear of failing and learn “that it’s acceptable to try and fail.”

Some of the projects supported by TFAF grants indeed have failed. For example, Viztec Inc. received a \$1 million award to help underwrite the commercialization of its plastic liquid crystal display technology licensed from Kent State University.<sup>66</sup> Though the company reported that it had achieved nearly all of its project goals except the level of production, it was unable to obtain financing, laid off its employees and closed down last year.<sup>67</sup> The company aimed to use a high-speed, continuous production process to make the plastic displays for use in cell phones and other products. Lou Schneeberger, Viztec’s chief financial officer before it closed, said the company unsuccessfully sought \$10 million in financing in order to build a higher-volume production line. Now, he said, the technology is in the final stages being sold to Samsung, the big Korean electronics company.

The TFAF program has yet to produce any home-run new products. It could help generate some successful businesses, but that will take more than a year or two—or even five, as Glennan’s experience illustrates.

### **Intermediaries**

During the 2000-2001 biennium, the TAF program supported 19 intermediaries, from Scitech and the Akron polymer effort to incubators and regional technology initiatives in Cincinnati and Southeastern Ohio. “Partly, we needed to build certain kinds of technology infrastructure in the state,” Samuel said.<sup>68</sup> This succeeded in some communities, he said. Since then, the program has become more focused on specific goals than the broad development of an infrastructure to support high-tech start-ups, and few such grants have been awarded.

### **Early stage capital**

For years, there has been debate over whether adequate venture capital is available in Ohio. This is capital required to get new enterprises started and off the ground to the point that they sell stock to the public or are acquired. Many high-tech advocates cite such a lack, pointing out that Ohio attracts less venture capital investment than many smaller states. Conversely, researchers in Cleveland, where seven TFAF grants have gone

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<sup>66</sup> The grant made some big promises: “...with the assistance of the State of Ohio, the commercialization of Viztec’s platform technology is very likely to result in a global shift of liquid crystal display manufacturing from the eastern rim countries to the State of Ohio...Ohio will become the plastic liquid crystal capital of the world as Ohio was the rubber capital of the world. The time is right and all essential elements are in place and available. This grant will begin a new age.” TECH 02-070, Viztec Inc., Commercialization of Plastic Liquid Crystal Displays, Grant request by Viztec Inc., p. 14.

<sup>67</sup> TECH 02-070 Viztec Inc. Final Report and interview with Lou Schneeberger, former chief financial officer, Nov. 5, 2003. ODOD referred Viztec to early-stage capital funds that have received state assistance. However, according to Schneeberger, no venture capitalists were willing to invest. Venture capitalists in the existing glass-display business haven’t made money, he said. Other issues included whether Viztec would be able to make the displays in high volumes, and whether it had enough legal protection of the technology.

<sup>68</sup> Interview with Frank Samuel, Sept. 24, 2003.

for early-stage capital efforts, argued that such capital was not an issue in a recent paper about that metropolitan area’s history of innovation:

“Like many other communities searching for a “magic bullet,” Cleveland leaders concluded in the mid-1980s that a lack of venture capital accounted for the low start-up rate of new high-tech businesses in the region. In response, they created a new venture capital fund. Yet today most of this fund’s investments are located in other regions. In fact, Cleveland investors have made many venture investments – at least one group manages a multibillion dollar pool of venture capital funds from the center of the city itself – yet the Cleveland region has produced very few new high-tech companies in recent years, and certainly not a new industry. The venture capital fund effort has in effect served as an effective experiment, demonstrating that the region’s problem is not a lack of local capital for new ventures.”<sup>69</sup>

A 2001 report to the Technology Action Board<sup>70</sup> noted the disagreement over the adequacy of such capital in Ohio, and said it was a matter of definition. The study found that the state had almost \$4 billion in venture capital under management in 21 firms with an office in the state, but that much of that was not available for investment and only \$240 million in six established funds that would consider early-stage “seed” investments.<sup>71</sup> Several of the emerging funds focused on such early-stage deals were the result of TAF grants, it said.

Supposing that Ohio does need more seed or venture capital based in the state, how much is required? If there were \$500 million to \$600 million in early stage capital in Ohio being invested on a continuing basis, “I’d say we probably had enough,” said Samuel. Yet he added that, “Maybe I’m all wet, and \$600 million is half of what we need.”<sup>72</sup> In short, we lack a clear idea of how much early-stage capital the state needs.

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<sup>69</sup> Michael S. Fogarty, Gaspar S. Garofalo and David C. Hammack, *Cleveland from Startup to the Present: Innovation and Entrepreneurship in the 19<sup>th</sup> and Early 20<sup>th</sup> Century*, A Report of the Center for Regional Economic Issues, Weatherhead School of Management, Case Western Reserve University, March 2002, pp. 5-6. A recent article in *The Cincinnati Enquirer* said the same about that city. “Cincinnati has the unusual dilemma of having too much investment capital for too few worthwhile startups. Most of the money raised for startups, investors say, leaves the region,” wrote James McNair in “Site proves startups can count on local support,” *The Cincinnati Enquirer*, Sept. 10, 2003.

<sup>70</sup> “Venture Capital in Ohio,” Report to the Technology Action Board, by TAB Subcommittee on Early Stage Capital (Jeff Wilkins, Dorothy Baunach and Patricia Snider), January 2001. The report noted that generally venture capital firms say there is enough, while entrepreneurs say there isn’t.

<sup>71</sup> A 2002 report done for the Department of Development said that, “Overall, Ohio appears to have limited venture funding available and that which is available, is generally targeted at later-stage investments. Ohio has a considerable number of venture capital firms located in its more mature markets; however, these venture capitalists are typically investing their funds outside the state. The reason cited for this is the belief that there is a lack of “good deals” in Ohio. This could possibly be caused by a very limited amount of pre-seed/seed sources of financing for technology entrepreneurs to feed the pipeline for these later-stage investments.” From “Innovation—The Future of Ohio’s Economy: An Ohio Technology-based Economic Development Strategy,” Prepared for the Ohio Department of Development, Technology Partnership Practice, Battelle Memorial Institute, Cleveland, Ohio, May 2002, p. 55.

<sup>72</sup> Interview with Frank Samuel, Aug. 12, 2003.

The 20 TFAF grants given for early stage capital since FY2000, including some more general ones of which that was one component, have totaled \$14.2 million.<sup>73</sup> Some of these grants go toward taking technologies that are in the lab and validating that they can be the foundation of start-up companies. Others go to organizing new seed funds that will provide financing for very young companies, or financing those funds once they have been organized.

A number of these grants are too recent to evaluate. For instance, the Cleveland Clinic was awarded a \$1.08 million grant in the fall of 2002 for its technology validation fund that it promised would lead to the formation of eight new companies over two years that will receive follow-up support, either through private investment or the government.<sup>74</sup> Besides two foundations that are providing match money along with the Clinic, a dozen outside investment funds have said they will invest \$14.5 million or more in these firms if the Clinic succeeds in spinning them off.

Cleveland's BioEnterprise Corp. won a \$350,000 grant to organize a \$20 million investment fund. It expects to fund 40 companies over five years, which by that time will employ 1,000 workers making an average \$60,000. Queen City Angels, a group of Cincinnati area investors, is receiving a \$979,000 grant to form a new fund that will invest in and mentor very young technology companies in Southwest Ohio "that might otherwise never garner enough resources to succeed." The fund expects to invest in four to six companies that will employ 15 to 20 people, attract follow-on investments in two or three of them, and invest along with other TFAF grantees in at least one venture.<sup>75</sup>

Some of the venture funds supported by TFAF grants have raised tens of millions of dollars. For instance, what is now Reservoir Venture Partners L.P. received a two-year, \$1.625 million grant in FY2001 to form a Central Ohio fund. It had raised \$28 million and invested in four companies by the end of June.<sup>76</sup> A \$500,000 grant to Ohio University helped it get the Appalachian Regional Entrepreneurial Initiative off the ground, according to Hugh Sherman, faculty director. The initiative helped create Adena Ventures, a \$32.5 million venture fund based in Athens that got half its money by becoming the first company to qualify under the U.S. Small Business Administration's New Markets Venture Capital Program.<sup>77</sup> So far, Adena has invested in three West Virginia companies, but Sherman said in October that four Ohio firms are in the final

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<sup>73</sup> Six of these, for a total of nearly \$3 million, included other goals besides early-stage capital development, and another six, totaling \$3.76 million, were awarded in FY2003. Thus, eight grants totaling \$7.5 million were awarded exclusively for early stage capital before last fiscal year. Not included in the above total are two FY2004 grants totaling \$2.13 million approved by the Third Frontier Commission in October.

<sup>74</sup> Grant Agreement between the State of Ohio Department of Development and the Cleveland Clinic Foundation, ODOD Agreement Control Number of TECH 03-025, Exhibit 1.

<sup>75</sup> TECH03-038, Queen City Angels, QCA First Fund, Exhibit 1 – Scope of Work, p. 3.

<sup>76</sup> TECH 01-048 Reservoir Venture Partners L.P. (formerly Battelle Technology Fund L.P.), TAF Quarterly Report, June 30, 2003, p. 1. This grant was awarded to the Columbus Technology Leadership Council for what was then called the Columbus Emerging Technology Fund.

<sup>77</sup> TECH 00-099 Ohio University, Regional Entrepreneurial Initiative, Final Report, December 2002, pp.6-7; Interview with Hugh Sherman, faculty director, Appalachian Regional Entrepreneurial Initiative, Oct. 1, 2003.

stages of the process. “The real work only started in the last year,” said Sherman, “...so I think that’s very reasonable.”

As of last January, Early Stage Partners, a Cleveland pre-seed and seed fund that has been backed by two TFAF grants, had raised \$31,825,000 and invested \$9.6 million in eight companies.<sup>78</sup> However, BioVentures Management Co., manager of a new Cincinnati seed fund for biomedical investments that received a \$350,000 TAF grant, raised millions of dollars but fell short of its goal and went out of business.<sup>79</sup>

Altogether, seed and venture funds with TFAF support have raised at least \$134 million, according to reports available at the Department of Development in mid-August. “Between what the Technology Action Fund has instigated and what the private market has, there’s quite a lot of venture capital here, compared to two years ago, which is really a sea change,” said Samuel last June. The early-stage capital portion of the program, “despite difficult times, has gone pretty well,” he said in a later interview.<sup>80</sup> More such capital also may become available under Senate Bill 180 passed by the General Assembly last year, which created a new Ohio Venture Capital Program to support seed and venture capital partnerships.

### **Ohio Manufacturing Jobs to China?**

The new venture funds have supported more than two-dozen new enterprises. Their businesses range from spinal implants to Internet security.

One of the eight portfolio investments that Early Stage Partners has made is SupplierInsight, a Cleveland software company that helps businesses improve their management of suppliers. “We have been impressed by SupplierInsight’s progress with several new and existing clients and the demonstrated value it delivers within the corporate strategic sourcing area,” said ESP Managing Director James D. Ireland III last January in describing his firm’s increased investment in the company.<sup>81</sup>

One of SupplierInsight’s services is helping companies find and evaluate suppliers in low-cost countries. Describing its capabilities in China on its web site, the company says: “Specializing in low-cost country sourcing, SI’s regional and commodity experts help you rapidly find the right suppliers for your products, materials, and capabilities needs.” It

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<sup>78</sup> TECH 01-050, ESP Holdings, LLC, Early Stage Partners LP, Quarterly TAF Report, Quarter Ended Dec. 31, 2002, Jan. 29, 2003. The company has ambitious goals: Over five years, it expects outcomes from its fund to include formation and growth of 45 companies with over 2,000 jobs, payrolls approaching \$90 million and at least 4 to 10 initial public stock offerings. TECH01-050 Early Stage Partners LP, grant proposal abstract, p. 2.

<sup>79</sup> TECH 00-086 BIO/START, BioSeed Fund, Scope of Work, June 1, 2000, to June 30, 2001, and TECH 00-086 BioVentures Management Company, Quarterly Report: FY01 + July.

<sup>80</sup> Interviews with Frank Samuel, June 17, 2003, and Sept. 24, 2003, respectively.

<sup>81</sup> “SupplierInsight secures \$2.0 million in funding,” SupplierInsight press release, Jan. 31, 2003. [http://www.supplierinsight.com/aboutsiv3\\_pressR013103.cfm](http://www.supplierinsight.com/aboutsiv3_pressR013103.cfm) According to the release, Early Stage Partners was one in a group of six investors. Ireland did not respond to requests for information for this report.

goes on to say, “SupplierInsight has over 100 trained auditors in China ready to complete supplier facility reviews. Our standard assessment form has hundreds of questions that cover general information, infrastructure, innovation, people and process.”<sup>82</sup>

One of three goals cited for the Third Frontier program, according to development department officials, is that “Within three years, we’ll see manufacturing capital investment grow in excess of the national rate.”<sup>83</sup> The likely outsourcing of Ohio manufacturing jobs to China is not in keeping with that goal.

Early-stage funds supported by TFAF grants are aimed at “Increasing the availability of professionally managed, early-stage capital to Ohio start-up or early-stage technology companies.”<sup>84</sup> One of the criteria used in judging early-stage capital proposals is “Ohio investments.” According to ODOD, there is no numeric requirement for any minimum proportion of their investments that must be made in Ohio. “Each fund is reviewed on a case-by-case basis,” the department said.<sup>85</sup>

#### **IV Ohio Benefits?**

“Is the proposal an attractive investment for the state of Ohio?” The answer to this question, posed in the fiscal 2004 request for proposals involving technology commercialization and fuel cells, counts for 20 percent of the application’s evaluation. Elsewhere, the document states flatly: “Any commercialization that results must benefit Ohio through investment, sales, or job creation.”<sup>86</sup> Of course, as outlined earlier, for all proposals a substantial portion of the project and the benefit from it must occur in Ohio.

Three of the 35 technology commercialization grants made prior to FY2003 benefited companies that later decided to move out of state. While that remains uncommon, it highlights the risk of investing in technology that can easily move from place to place. But that risk can be reduced. The Department of Development has taken some steps in that direction, but more can be taken.

One of the three projects involved an \$895,000 grant to Cincinnati-based TechSolve Inc. aimed at developing a new machine tool in Ohio that would cut metal at ultra-high speeds. Just months after the first order for the new product was announced and the project was declared a success during a visit by Gov. Taft, the company producing the machine tool announced it was shutting its Ohio operation and moving production out of state.

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<sup>82</sup> [http://www.supplierinsight.com/examples03\\_china.cfm](http://www.supplierinsight.com/examples03_china.cfm).

<sup>83</sup> Presentation of Jean Carter Ryan and Pat Valente at Communities, Higher Education and the Changing Economy conference, Columbus, Ohio, June 18, 2003.

<sup>84</sup> Third Frontier Action Fund, 2004 Request for Proposals, p. 8.

<sup>85</sup> Response to questions by Policy Matters Ohio, Ohio Department of Development, Oct. 24, 2003, p. 4.

<sup>86</sup> Third Frontier Action Fund, 2004 Request for Proposals, pp. 8 and 20. According to a presentation outlining the program for applicants in these two areas the benefits for Ohio might include jobs, revenues, companies formed, scalable businesses, strategic visibility, and linkage to other S&T programs. “Third Frontier Action Fund, Pre-Proposal Meeting, June 25, 2003, Taratec Corp., p. 5.

<http://www.odod.state.oh.us/200406-25-03Pre-ProposalMtg.pdf>

TechSolve, a nonprofit that is one of the state’s Edison centers and offers manufacturers assistance, received the two-year grant in fiscal 2001 to help Cincinnati Machine develop the new high-speed machine for aerospace work, dubbed the HyperMach. The grant was part of an effort projected to cost \$2.26 million in total and including others such as Boeing Co. and the U.S. Air Force. Summarizing the intent of the grant, ODOD said: “The goal of this initiative is for Cincinnati Machine to bring HyperMach technology to market ahead of competitors.”<sup>87</sup> And indeed, the company said in a July 31, 2002, press release: “The funding served as the catalyst to accelerate the introduction of HyperMach as a commercial product.”<sup>88</sup> Cincinnati Machine boasted that the new machine could reduce the cost of manufacturing aluminum aircraft parts by as much as 85 percent.

According to the press release, Gov. Taft said the HyperMach project would have a great impact on Ohio’s economy because it would directly generate about 3,600 jobs in the state. “Your success is Ohio’s success. We made a good investment here through our Technology Action Fund...” Cincinnati Machine US President Dan Janka said: “HyperMach has secured Cincinnati Machine and the State of Ohio as the leading suppliers of advanced high speed technology for years to come, validating Ohio’s wisdom to invest in high technology research.”

Yet just a little more than three months later, Cincinnati Machine’s parent company, California-based UNOVA Inc., announced that it was merging Cincinnati Machine with another division, ending nearly a century of production in the Cincinnati neighborhood of Oakley.<sup>89</sup> At the time of the announcement, the company employed 750 at its complex there. It will produce its machines for the aircraft industry outside of Ohio.

Thomas F. McClure, TechSolve’s manager for the program, said in an interview that it had transferred some of the techniques it learned during the project to other Ohio manufacturers.<sup>90</sup> The project also helped TechSolve and others understand the potential of smart machining, McClure said, in which a computer tracks what a machine operator is doing and recommends changes to improve efficiency. TechSolve subsequently won a federal grant to help advance a related technology.

“The departure of Cincinnati Machine is an unfortunate event for the state of Ohio,” McClure said. “However, in the scope of the project it really has very little bearing on the outcome. We were successful in developing a new technology that Cincinnati Machine was able to sell.” TechSolve used it to win the grant, and potentially, a good chance of leading the nation in smart machining, he said, which could bring research jobs to Ohio. Some components for the HyperMach will still be made in Ohio, he added. “The investment wasn’t in the HyperMach, it was in high-speed machining technology.”

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<sup>87</sup> Synopsis of Projects Funded – 2001 Technology Action Fund, Ohio Department of Development.

<sup>88</sup> “Cincinnati Machine Receives First Order for HyperMach Ultra High Speed Profiler, Ohio Gov. Bob Taft Announces,” News Release, Cincinnati Machine, a UNOVA company, July 31, 2002. [http://www.cinmach.com/compnews/newsre\\_set.htm](http://www.cinmach.com/compnews/newsre_set.htm)

<sup>89</sup> “Cincinnati Machine and Lamb Technicon to Merge Operations,” UNOVA Inc. press release, Oct. 1, 2002, and “The Mill’s Demise Started Years Ago,” Mike Boyer, *The Cincinnati Enquirer*, Oct. 3, 2002.

<sup>90</sup> Interview with Thomas F. McClure, Sept. 15, 2003.

Both the original proposal and the final report clearly show, however, that the machine itself was crucial to the effort. TechSolve reported to the Department of Development that it had demonstrated the machine to many of Cincinnati Machine's potential customers.<sup>91</sup> Though there may be potential in what McClure describes, it is just that – potential. Meanwhile, a technology Ohio citizens helped pay for will benefit an out-of-state company that has left many Ohioans unemployed.

Asked about whether it had levied any penalties after the announcement of the Cincinnati Machine departure, the Department of Development said: “The TAF grant for the HyperMach project was to TechSolve, which is located in Cincinnati. TechSolve holds the information developed under the project. There was no action warranted for that reason.”<sup>92</sup>

### **Aid from Ohio – and Kentucky**

In a parallel case, another TFAF grant helped establish a start-up company that now is based in Kentucky. ChipRx Inc. was started up in Columbus when Marc Madou was a professor at Ohio State University. The company, cofounded by Madou and University of Kentucky Professor Sylvia Daunert, was to commercialize technology from both universities that would use tiny implantable chips to release drugs in the body over time. The OSU Research Foundation received the two-year, \$500,000 grant in FY2000. The grant proposal that was approved said: “The business objective of the ChipRx team is to form and develop an organization able to realize the high commercial growth potential of novel responsive drug delivery platforms, so as to improve the public health and benefit the economy of the state of Ohio.”<sup>93</sup> Among other things, the grant covered hiring employees, preparing patents and legal rights to the technologies, winning federal funding and further research. Some of this was accomplished, according to the most recent quarterly progress report that was made available by the Department of Development.<sup>94</sup>

“The TAF funding gave us a start, and I believe we obtained fantastic technical results,” Madou said in an interview.<sup>95</sup> Madou left Ohio State in 2001 for a California company, Nanogen Inc., and now is a professor at the University of California at Irvine. Asked why ChipRx is no longer in Ohio, he said: “Principally because I left, I would say.” Madou

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<sup>91</sup> TECH 01-062, TechSolve Inc., HyperMach Ohio Initiative, Final Report, p. 6. See also HyperMach Ohio Initiative, TechSolve Inc., TAF Grant Request, Dec. 15, 2000, pp.7-8.

<sup>92</sup> Response to questions by Policy Matters Ohio, Ohio Department of Development, Oct. 24, 2003.

<sup>93</sup> TECH 00-080, The Ohio State University Research Foundation, Responsive Drug Delivery on a Chip, Scope of Work, p.1.

<sup>94</sup> TECH 00-080, Drug Delivery on a Chip: ChipRx, TAF Quarterly Report: Q2FY03. This report covered the last quarter of calendar 2002. The final report for the project from earlier this year was not made available to Policy Matters Ohio by the Department of Development, which cited trade secret information (Letter from Norm Chagnon, staff director, Third Frontier Commission, to Zach Schiller, Policy Matters Ohio, Oct. 2, 2003). This was puzzling, given that an unedited earlier quarterly report from the same project was provided. The department had not responded by the time of this report's publication to a mid-October request to provide a copy in which trade-secret information was deleted.

<sup>95</sup> Interview with Marc Madou, founder and co-chair of Scientific Advisory Board, ChipRx, Sept. 22, 2003.

said he moved back to California because he had spent most of his life there and for family reasons.

The company now has a Lexington, Kentucky, address and operations will be split between there and Orange County, California. Genetic engineering of the proteins used for sensing will be handled in Kentucky, Madou said, while the miniaturization of the hardware will take place in California. The company will only hire staff once it lands venture-capital funding, which Madou is hoping for soon.<sup>96</sup>

Richard Fortner, associate director and manager of the Engineering Experiment Station at the OSU College of Engineering, which oversaw the research, said that the flashy science involved seemed to have lots of potential. “We were all enamored with this technology and turned a blind eye to what happened if we lost the principal players,” said Fortner, who has been working on an orderly closeout of the project at the university over the last three years.<sup>97</sup> He compares that to a foam landing of an airplane. “(ChipRx) never attracted any capital beyond the core research funding, and with Madou leaving it was a rather significant blow,” Fortner said. He was especially involved, he said, in trying to help students who were at OSU when Madou left. Fortner said that the work called for in the grant, some of which was subcontracted to the University of Kentucky along with ChipRx, was completed. Ohio State has a license agreement with ChipRx covering technology developed at the university that includes an ownership stake in the company.

The OSU Research Foundation told ODOD in a report covering the fourth calendar quarter of 2002 that ChipRx needed financial backing, and that “the sources of capital that connect with the company at this point will have a very large influence on the geographic location of the company. It will be possible to keep the company in Ohio, if Ohio seed funds invest in the company – but there is little room for hesitation.”<sup>98</sup>

Oddly, earlier in that year, ChipRx received a \$100,000 investment by the Kentucky Science & Technology Corp. The program, called the R&D Voucher Fund, is “a \$3 million investment fund that enables small and medium-sized Kentucky-based firms to undertake research and development in working partnership with Kentucky university researchers,” according to the state’s Council on Postsecondary Education.<sup>99</sup> The company appears to have been seen as locally headquartered in both Ohio and Kentucky at the same time.

OSU’s Fortner said that he was aware that the company had received Kentucky funding, but he didn’t know what ChipRx did to get the money or what the basis for it was. The University of Kentucky was a subcontractor on the TFAF grant all along, he noted, and

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<sup>96</sup> Madou argues that it isn’t far-fetched for Ohio to generate economic activity from ChipRx and that further investment would bring local benefits, but the company has no physical presence or employees in the state now.

<sup>97</sup> Interview with Richard Fortner, Nov. 6, 2003.

<sup>98</sup> TECH 00-080, OSU Research Foundation, Drug Delivery on a Chip: ChipRx, TAF Quarterly Report: Q2 FY03, p. 5.

<sup>99</sup> Council on Postsecondary Education, Annual Report (for 2001-2002), House Bill 572, Knowledge-based Economy Programs, p. 14.

companies often get multiple sources of funding. Fortner said the university had acted in good faith and kept the Department of Development informed of Madou's departure and changes in the project's budget. ChipRx is incorporated in Ohio, but uses a Kentucky address.

Asked whether it had penalized the grantee or looked into whether the project accurately portrayed the company's location in its reports, the Department of Development said, "If ChipRx has moved to Kentucky, the decision to do so is recent. ODOD is investigating the situation."<sup>100</sup> This suggests a lack of awareness by the department.

### **A biotech beneficiary**

Quark Biotech Inc. is another beneficiary of the TFAF program that is now moving out of Ohio. Quark, an Israeli company, moved its primary U.S. base from Chicago to Cleveland in 2001 when Andrei Gudkov took a job as chair of the molecular biology department at the Cleveland Clinic's Lerner Research Institute. Dr. Gudkov had been working closely with Quark while doing research at the University of Illinois.

Quark was awarded a two-year TFAF grant of \$1,575,000, along with other state incentives, to move to Ohio. It promised to start operations in Cleveland with 30 employees, and increase that to 50 by the end of the grant in two years. At that point, "the company will be making plans to build and equip its own 50,000 square foot facility and hire another 250 people, bringing the total in five years to 300," it said in its grant proposal.<sup>101</sup>

Quark now is moving its U.S. headquarters from Cleveland to Fremont, Calif.; it never employed more than 15 in Ohio. Like many biotech companies, it was affected by a slump in the capital markets, and was unable to raise the funds that it had planned. Its efforts to do so locally also did not come to anything. Quark had to cut back, and refocused on products that it hopes to bring to market soonest. "The company has had to make some really tough decisions in the last nine months on what it's going to fund, and justifiably so," said Controller Michael Halliburton in a September interview.<sup>102</sup> Originally, it had planned to do that clinical development of new products from Cleveland. However, that function instead shifted to California, where Quark had recently acquired another business. That left Cleveland as strictly a research operation, one that the company believed it could ill afford given its finances.

Quark told the Department of Development in March, 2003, that it was not hiring as many personnel as it had originally budgeted, in part because "we were unable to recruit a product development team to our Cleveland facility due to the challenges of finding local talent or persons willing to move to the area. This forced the company to hire these

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<sup>100</sup> Response to questions by Policy Matters Ohio, Ohio Department of Development, Oct. 24, 2003.

<sup>101</sup> TECH 01-051, Quark Biotech Inc., QBI-CCF initiative for gene-based pharmaceutical development, grant proposal, p. 15. Separately, Gudkov was to bring 20, a number that would grow over time. The grant was contingent on Quark moving its U.S. headquarters and business operations to Ohio, and the last 10 percent of the grant was to be disbursed only when ODOD approved its final report

<sup>102</sup> Interview with Michael P. Halliburton, Quark Biotech Inc., Sept. 23, 2003.

positions in other locations in the U.S.”<sup>103</sup> Some sources close to the company say, however, that Quark’s top management was less comfortable in Cleveland than California, and that attempts to recruit in Cleveland and oversee the clinical trials there were only half-hearted. In fact, the person it hired to run that operation in California was working for another company in Cleveland when he was hired.

Halliburton argues that “at the end of the day, the (TFAF) money was not wasted,” since people were trained in biotech research and the company spent \$1.3 million renovating a building that can be used by other biotech companies. “Although in essence it was an incentive to move here, it was a research grant,” said Halliburton. Quark did the research that was called for in the grant proposal and fulfilled its obligations, he said.

Quark has received all but \$220,000 of the \$1,575,000 in TFAF funds.<sup>104</sup> “That money cannot be recovered because the company made no commitments in return, such as staying in Ohio for a certain number of years,” *The Plain Dealer* reported in September. “At the time of the Quark courtship, the state felt that it lacked the leverage to make demands of biotech companies willing to locate here, (ODOD Technology Division Deputy Director Pat) Valente said. Today, technology grants specify that if a company moves, the state can get its money back.”<sup>105</sup> ODOD said more recently in answer to a question that Quark’s performance is under review.<sup>106</sup>

Indeed, a 2003 TFAF grant agreement too recent to apply to Quark stipulates that, “Grantee shall make a good faith effort to maintain its headquarters and/or a substantial portion of its workforce in the State of Ohio for three years after the expiration of this Agreement...Grantee shall exercise a good faith effort to utilize the Funds to realize an economic benefit for the State of Ohio. Should the Grantor determine that the Grantee has failed to make a good faith effort in the conditions listed above, the Grantor shall determine whether and to what extent the Grantee may be required to repay the Funds to the Grantor.”<sup>107</sup>

As noted earlier, grant applicants must be based in or have a significant presence in Ohio (or do so as a condition of the award). The most recent award rules also stipulated that, “An applicant that becomes a TFAF grantee must maintain eligibility while the grant is open. A grantee that loses funding eligibility forfeits its award and must repay the State

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<sup>103</sup> Letter from Michael P. Halliburton, Controller, Quark Biotech Inc., to Sharon Roney, Technology Grant Coordinator, Ohio Department of Development, Technology Division, March 27, 2003.

<sup>104</sup> Interview with Halliburton, Sept. 23, 2003.

<sup>105</sup> “Quark Biotech takes generous local gifts on its move west,” Roger Mezger, *The Plain Dealer*, Sept. 23, 2003, p. 1. Quark’s contract did contain certain protective clauses. For instance, it said that if the company did not spend the money in accordance with the terms, conditions and time period of the contract, it shall return the funds improperly expended within 30 days of the expiration or termination of the agreement (TECH 01-051 Grant Agreement between State of Ohio, Department of Development, and Quark Biotech Inc., p. 1). Another clause said that anything it bought with the grant worth more than \$1,000 or with a life of more than 1 year shall revert to the state if grantee defaults or is terminated subject to the grant’s dispute resolution provision (p. 3).

<sup>106</sup> Response to questions by Policy Matters Ohio, Ohio Department of Development, Oct. 24, 2003, p. 1.

<sup>107</sup> Grant Agreement between the State of Ohio Department of Development and the Cleveland Clinic Foundation, ODOD Agreement Control Number of TECH 03-025, p. 2.

of Ohio the full amount of TFAF monies it has received plus interest.”<sup>108</sup> Such penalties were not mandated until the fiscal 2003 competition, which began in the fall of 2002.

The most recent FY2004 request for proposals also extended the term of most grants given under the program beyond the typical two years for most of the projects themselves.<sup>109</sup> This presumably will allow for penalties to be assessed if a company receives a TFAF grant and then moves out of state later. Thus, ODOD has tightened up its policies in several ways. However, its treatment of the TechSolve and OSURF-ChipRx grants indicate inattentive monitoring.

Ironically, the state’s Thomas Edison program – a program that was coordinated by ODOD – years ago contained more stringent requirements for grantees under its Innovative Research Financing Program. It mandated production in Ohio, and reimbursement of the state for the entire amount plus “a substantial penalty commensurate with the economic loss incurred by the State (e.g. in terms of lost jobs, lost tax revenues, etc.), should the patent holder, its licensees, or assignees locate or relocate the production or manufacture outside the State of Ohio.”<sup>110</sup>

## **V Reporting and Accountability**

As noted, grantees are required to submit quarterly and final reports. In a few instances, grant recipients have not provided reports on a timely basis. The department says that, “If a grantee is not current with required reports, then requests for payment are held until the required reports are received.” However, it does not keep a list of such actions.<sup>111</sup>

More often, grantees have not fully detailed in their reports progress they have made toward goals enumerated in their proposals. For example, the Greater Cincinnati Chamber of Commerce’s regional technology initiative was awarded \$500,000 over two years starting in FY2001 to boost the area’s high-tech economy. In the scope of work, it identified six outcome measures for what it called the Technology Growth Accelerator, including the increase in the number and size of technology companies and tech-related jobs, the amount of venture capital placed, funding devoted to technology research and

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<sup>108</sup> Third Frontier Action Fund, 2004 Request for Proposals, p. 5. The interest penalties were just added in the most recent award cycle. On the other hand, the most recent RFP omitted previous requirements that a significant portion of the project and the benefit from it must occur in Ohio while the grant is open (see Technology Action Fund, 2003 Request for Proposals, p. 9).

<sup>109</sup> Third Frontier Action Fund, 2004 Request for Proposals, p. 6. Under the RFP, grants for capitalizing an early-stage investment fund or creating a technology validation fund are for seven years; the grant terms for organizing an early-stage investment fund will be determined before the award. Grant terms for technology-commercialization and fuel-cell projects are for the length of the project (up to 24 months), plus three years.

<sup>110</sup> Ohio Department of Development, Thomas Alva Edison Program, Innovative Research Financing Program, General Guidelines, Oct. 6, 1983, Section L, p. 6.

<sup>111</sup> Response to questions by Policy Matters Ohio, Ohio Department of Development, Oct. 24, 2003.

others.<sup>112</sup> In its most recent quarterly report, the initiative provides no specific details on what has been accomplished according to these measures.<sup>113</sup>

Similarly, a 2-year, \$1.5 million award in FY2000 went to Ohio MicroMD Laboratory at Scitech to set up a lab where industrial and academic researchers could quickly develop tiny biomedical micro-devices for studies and testing. The grant also covered the establishment of iMEDD Inc. as the first commercial high technology tenant in OSU's Science Village. The final report lacks any results on a number of key milestones by the lab (e.g. jobs, research contract volume, company starts).<sup>114</sup>

Policy Matters Ohio asked the Department of Development if it had taken any action regarding grantees that had not fully detailed in their reports progress they had achieved on their goals. The department said, "If the information is missing we request it from the grantee."<sup>115</sup> However, ODOD did not respond to a specific request to provide details if it had taken any action.

It is impossible to judge how good a job the department does in enforcing project standards. It said in a written response to questions from Policy Matters that, "When appropriate, funds have been held until questions regarding performance have been adequately addressed." However, the department does not maintain a list of such actions, and it provided virtually no details despite a request for them.<sup>116</sup>

This record-keeping policy – or lack of one – does not allow the public to know whether the program is functioning as it should. Under their contracts, grantees must keep financial reports and other information for at least three years; in addition, "records required by Grantor with respect to any questioned costs, audit disallowances, litigation or dispute between Grantor and Grantee shall be maintained for the time needed for the resolution of said question..."<sup>117</sup> In other words, the department does not itself keep records on the same issues that it demands grantees to retain files on – or if it does so, they are kept in a way that the public is unable to review them effectively.

It also seems to suggest that project performance may not be fully taken into account when the department itself evaluates the program, or if grant recipients should reapply (11 grantees have received more than one grant during the course of the program).

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<sup>112</sup> TECH 01-052, Greater Cincinnati Regional Technology Initiative, Greater Cincinnati Chamber of Commerce, Exhibit 1, Scope of Work.

<sup>113</sup> TECH 01-052, CincytechUSA, TAF Quarterly Report, July 2003.

<sup>114</sup> TECH 00-084, The Ohio MicroMD Laboratory at the Science and Technology Campus of The Ohio State University, Oct. 1 – Dec. 31, 2002, Final Report.

<sup>115</sup> Response to questions by Policy Matters Ohio, Ohio Department of Development, Oct. 24, 2003, p.2.

<sup>116</sup> Asked about any penalties it had assessed for not meeting project standards, including withholding funds, the department cited one specific grant. Quark's performance is under review, it said. Ibid, p. 1.

<sup>117</sup> TECH 03-025, Cleveland Clinic Foundation, Grant Agreement between State of Ohio, Department of Development, and Cleveland Clinic Foundation, p. 3. The FY2004 RFP specifies that technology-commercialization and fuel-cell grantees must submit annual progress reports for three years after the close of the TFAF project period. Such reporting by early stage capital grantees is determined prior to the grant award. Third Frontier Action Fund, 2004 Request for Proposals, p. 5.

As noted, the Department of Development did not provide to Policy Matters Ohio even an edited copy of the final report of the ChipRx project in time for this study (It had earlier declined to provide a full copy, saying it contained trade secret information).<sup>118</sup> The request was made in mid-October.

Cleveland-based Biomec Inc. received the largest grant from the fund, \$1,875,000 in FY2000.<sup>119</sup> In its grant proposal, it said it would open new operations in Cincinnati and Columbus that, like its existing home base in Cleveland, would work to develop and commercialize biomedical products. “At the end of the two year program period BIOMECCentral and BIOMECSouth are planned to be self-sustaining operations with strategies for continued growth comparable to BIOMECCNorth,” it said in its grant proposal.<sup>120</sup> In late 2002, the company closed both of the new offices.

Biomec CEO Trevor O. Jones said, “We found we could more efficiently mine technology around the state from a single source, namely Cleveland, and at a much lower cost, and use the fund that we got more effectively.” For example, “Why pay for three (receptionists) when we could have just one here and do it more effectively?” Jones said that Biomec was able to use the TAF grant to expand its business model and attract more Small Business Innovation Research program grants from the National Institutes of Health. “The net result was in 2001 we received more SBIRs from NIH than any other company in the U.S.”

Two of the goals of the grant project were the creation of high paying scientific and technical jobs, along with skilled manufacturing jobs. “By the end of the second year the two new entities will have a portfolio of intellectual property, a sustained funded SBIR program, and plans to manufacture, market, and commercialize the products under development while continuing to create jobs and fueling economic growth within Ohio,” the scope said.<sup>121</sup> Such jobs will be created, Jones said. “There’s no such thing as instant job creation in the biomedical business,” he said, where new products require clinical trials and regulatory approval.

An argument can be made that for some of these projects to be long-lasting efforts with real impact, they need more than the two-year spark of TFAF. On the other hand, these projects aren’t supposed to be dependent on long-term state backing. In fact, grantees are supposed to demonstrate in their proposals that they are viable after TFAF support ends.<sup>122</sup>

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<sup>118</sup> Letter from Norm Chagnon, staff director, Third Frontier Commission, to Zach Schiller, Oct. 2, 2003. See footnote 94.

<sup>119</sup> TECH 00-095 Biomec Inc., Accelerated Commercialization of Biomedical Technology, Work Scope, March 15, 2000.

<sup>120</sup> Ibid, p. 1.

<sup>121</sup> BIOMECC scope, p. 3.

<sup>122</sup> Third Frontier Action Fund, 2004 Request for Proposals, pp. 19-20.

### **Conflict of interest**

In 2001, TAF grant awards were temporarily delayed when an applicant who had been rejected questioned the awards process.<sup>123</sup> Among other things, he objected that those screening applications included some whose own organizations had applied for grants. Ultimately, state officials decided there was no bias in the result and awarded the grants.<sup>124</sup> However, the controversy contributed to an overhaul of the decision-making process, and the Technology Action Board started hiring outsiders to do much of the evaluation before it decided who would get the grants.

Since FY2002, two small Columbus-area companies, BizLogx LLC and Taratec Corp., have handled the evaluation of TFAF grant applications. Taratec's contract contains strong language covering conflicts of interest.<sup>125</sup> In fact, at the Oct. 14 Third Frontier Commission meeting where Taratec presented its recommendations for the FY2004 awards, the company noted one application in which it had stepped aside because of a conflict of interest. It used an outside reviewer, who presented the grant recommendation to the commission.

### **Evaluating the evaluators**

When Gov. Taft attended the first meeting of the Third Frontier Commission in July and gave the group its charge, he noted the need for an independent review of applications by national experts. After a conflict-of-interest issue emerged at the Biomedical Research and Technology Transfer Fund, too, the National Academy of Sciences was hired to review and continues to evaluate applications for that program.<sup>126</sup>

However, questions may be raised as to whether there has been adequate competition in the selection of the evaluators for the Third Frontier Action Fund.

BizLogx, a two-person firm based in New Albany, Ohio, was the only company that applied to evaluate the fiscal 2004 and 2005 TFAF early-stage capital grants. The Department of Development sent the request for proposal to BizLogx, which had done the evaluation in fiscal 2002 and 2003, and the Department of Administrative Services posted it for nine days on the state procurement web site. BizLogx submitted the only

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<sup>123</sup> "State Delays Tech Grants after Process is Challenged," Zach Schiller, *The Plain Dealer*, March 27, 2001, p. 3C.

<sup>124</sup> Interview with Frank Samuel, Sept. 24, 2003.

<sup>125</sup> TECH04-019, Taratec Corporation, Agreement for Services between State of Ohio, Department of Development, and Taratec Corporation, p. 2, and Exhibit 1 – Scope of Work and Budget, pp. 6, 17 and 18. Contained in State of Ohio Controlling Board, Operating Request DEV543-0405, Aug. 18, 2003. The BizLogx contract also contains anti-conflict of interest provisions. The Department of Development described the protections this way: "Based on the Letters of Intent, the contractors performing evaluations are given a listing of potential applicants for the focus area they review. The contractor identifies any possible conflicts of interest they may have. Once the proposals are forwarded to the contractor they inform us of potential conflicts of interest and propose a remedy for our review and direction. Legal staff is consulted and solutions to avoid potential conflicts are chosen." Response to questions by Policy Matters Ohio, Ohio Department of Development, October 24, 2003, pp. 4-5.

<sup>126</sup> "State selects biomed project evaluator," William Hershey, *The Dayton Daily News*, July 17, 2002, "State asks third party to evaluate research bids," David Lore, *The Columbus Dispatch*, Sept. 13, 2002, and State of Ohio, Controlling Board No. DEV379-03, Feb. 24, 2003.

proposal, and its \$244,140 bid for the two years of TFAF work was approved by the State Controlling Board on July 21, 2003.<sup>127</sup>

Earlier, the Department of Development had said in its August, 2002, Controlling Board request for its fiscal 2003 contract with BizLogx that the contract would not be renewed.<sup>128</sup> It said the same thing in asking for a contract amendment last May that added some work on two other programs, the Ohio Venture Capital Fund Program and the Innovation Ohio Revolving Loan Fund Program.<sup>129</sup> Yet BizLogx was retained to continue work on all three programs in fiscal 2004. While the new contract may not be a renewal in a strict, technical sense, in that the company is providing additional services, parts of it call for continuation of work on the same projects.<sup>130</sup> In short, while BizLogx may be an entirely capable contractor, the state has not followed the highest standards in selecting and continuing to employ the firm.

Questions also may be raised about the Department of Development's handling of its contracts with Taratec. The department told the Controlling Board in February, 2002, when it requested to hire Taratec to do TAF evaluations for fiscal 2002, that the \$229,645 contract would not be renewed.<sup>131</sup> Yet the 15-person firm was hired to handle the evaluation of TFAF technology commercialization and fuel-cell grants in Fiscal 2003 without a request for proposal. "ODOD determined that in order to maintain quality and continuity, while minimizing the learning curve for reviewing proposals, Taratec Corporation would be used for the technical evaluation process in the 2003 TAF round of funding," the department said.<sup>132</sup> Technically speaking, the contract may not have been considered a "renewal" of the existing contract because it contained some additional work such as the fuel-cell evaluation, but an explanation of why there was a change of heart should have been included.

Taratec was selected for its current contract, worth \$722,085.71 over two years, through a competitive process in which two other contractors also bid for the business.<sup>133</sup> Taratec was the high bidder of the three, with a quote that was effectively \$131,646 higher than its closest contestant, the American Association for the Advancement of Science. Taratec

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<sup>127</sup> State of Ohio Controlling Board, Operating Request DEV482-04, July 21, 2003.

<sup>128</sup> State of Ohio Controlling Board, Operating Request DEV 293-03, Aug. 26, 2002.

<sup>129</sup> State of Ohio Controlling Board, Operating Request DEV433-03, May 5, 2003, p. 3. The Ohio Venture Capital Fund Program is designed to increase early-stage capital available in the state through an investment fund backed by tax credits to protect against losses by those who invest in it. BizLogx was hired to assist in the process for implementing the program, from establishing an investment policy to drafting the RFP for a program administrator. The Innovation Ohio Loan Fund Program is a \$100 million revolving loan fund to help Ohio manufacturers in five target industries develop new products. BizLogx was hired to help develop the program guidelines, underwriting and evaluation criteria.

<sup>130</sup> For instance, it includes 155 hours of work on the original OVCFP project. See State of Ohio Controlling Board, Operating Request DEV 482-04, July 21, 2003, p. 7.

<sup>131</sup> State of Ohio Controlling Board, Operating Request DEV146-02, Feb. 25, 2002, p. 4.

<sup>132</sup> State of Ohio Controlling Board, Operating Request DEV 333-03, Oct. 28, 2002, p. 2. ODOD noted that Taratec had been chosen through an RFP process in FY2002, and at that time it was determined that the firm provided a wider range of experience and greater expertise than others; it also cited Taratec's methodology, which involved a more extensive review process.

<sup>133</sup> State of Ohio Controlling Board, Operating Request DEV 543-0405, Aug. 18, 2003.

was selected, the department said, because of “(1) the level of detail provided in evaluating and scoring the proposals, and (2) verifying the market for the subject technology of the proposals. Taratec addressed all of the issues in depth and is using one more reviewer than the others.”<sup>134</sup>

Samuel said he was not familiar with the process used to select the evaluators and referred questions about that to ODOD. However, he said that, “Based on the work product they provided to the board, and the board’s general feeling over the work product, it was a great improvement over where we had been before. Whether we can make further improvement, we should always be trying to make further improvements.”<sup>135</sup>

The Department of Development did not respond to questions about its contracts with BizLogx and Taratec prior to the publication of this report.

## **VI Conclusions and recommendations**

Frank Samuel, who has had a key role in the Third Frontier Action Fund since he became the governor’s science adviser in 2000, said that the program has succeeded “pretty well, all things considered.”<sup>136</sup> As he describes it, the program has helped build the technology infrastructure in some parts of the state and generated early-stage capital in a difficult environment. “Technology commercialization has got some wins and losses, I guess,” said Samuel, calling that area “the one that’s hardest to predict in advance. That’s the risky one.” In addition, he said, “The fund has had an effect far beyond the actual dollars by creating a lot of buzz, a lot of interest, a lot of activity.” The program gets between 120 and 160 applications a year, he said.

Yet the program suffers from serious deficiencies. It has not delivered a significant number of new jobs, a long-standing goal. Though it’s still early and more new products could come out of the program, commercialization results so far are not substantial. Early-stage capital grants have contributed to raising money for such funds, but towards an overall goal that is unclear. Meanwhile, an investment by one fund in a company that helps customers find suppliers in China underscores a lack of appropriate controls over the program. And three beneficiaries of the program have moved out of state. Moreover, the selection process for program evaluators has not consistently been competitive, and oversight by the Ohio Department of Development has been lax. Altogether, the program’s impact on the commercial economy has been slight and it has not been sufficiently accountable.

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<sup>134</sup> Ibid, p. 3.

<sup>135</sup> Interview with Frank Samuel, Sept. 24, 2003.

<sup>136</sup> Interview with Samuel, Sept. 24, 2003.

If state efforts such as the Third Frontier Action Fund – or regional ones such as one recently proposed in Northeast Ohio<sup>137</sup> -- are to succeed they must have clearly defined goals, for both the program as a whole and for individual grantees. Grant evaluators must be selected through a clearly competitive process. Steps that have been taken to ensure Ohio benefits should be monitored and additional ones should be taken. More systematic effort must be made to ensure that grantees are delivering on the promises they make. Taken together these steps would add accountability to the Third Frontier Action Fund.

### **1) Define program goals**

The Third Frontier Action Fund program should only continue if it is accountable. To ensure that, the state first needs to define more precisely what the program is trying to accomplish.

Specifically, the goals of the program to support early-stage funds need to be more clearly defined for the state to support such activity. Do Ohio companies need more locally based capital? If so, how much? And is this best invested in technology-based start-ups, or in small, existing companies that may have a proven record, good pay and benefits and an existing workforce whose jobs may be at stake?

The TFAF looks for the development of new companies and products based on new technologies. However, the Glennan initiative and others teach us that commercialization takes a long time. When start-up companies are created, they may not employ large numbers of workers. In short, while there is the possibility of a big success story, TFAF projects may not create significant numbers of new jobs in the immediate future. The state should recognize this in its goal-setting for the program. The Third Frontier Commission also should weigh whether to focus the TFAF's commercialization efforts exclusively on small companies, as opposed to aiding billion-dollar companies and institutions that have substantial resources of their own.

### **2) Define individual grantee goals clearly**

The goals of individual grantees also should be defined more clearly. To allow better monitoring of performance, grantees should clearly report on how they have done on the milestones they enumerate. If there are job or new-company creation objectives, they should be clearly spelled out, along with those for sales, investment and financial performance or new metrics that may be developed because of TFAF's overall goals. Then, grantees should state specifically in the progress charts that are included in their quarterly reports what these goals were and exactly how much headway has been made on them.

### **3) Improve enforcement and record-keeping**

ODOD needs to be an active, rather than passive, enforcer. Though earlier requirements may not have allowed ODOD to crack down on beneficiaries moving out of state, it's not even clear that the department has always been aware of it. ODOD conducts visits to

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<sup>137</sup> An editorial in *The Plain Dealer* proposed recently that eleven Northeast Ohio counties levy a 0.25-cent sales tax for perhaps five or ten years to support research institutes, venture funds and the like. "Going it Alone," *The Plain Dealer*, Nov. 9, 2003.

TFAF sites and reviews the quarterly reports; it also summarizes the quarterly reports. But more needs to be done. The department should insist that reports include information on milestones the grantees themselves set out.

It is unclear whether the Department of Development keeps records of when it has taken action because of untimely or insufficient reporting by grantees. The department said that it does not keep a list of such actions. However, it could keep them in individual grant files, or it could be that it has no such records because it has taken no such actions. ODOD should make clear that it takes the reporting requirements seriously, penalize grantees that do not meet them and keep a list of such actions. If it does not, then the extension of reporting requirements will be undercut. The department also should maintain accessible records of all of the instances in which it has cancelled or withheld funds for grants, or assessed other penalties for not meeting project standards.

Members of the public should have access to TFAF records under Ohio's public records act. Periodic outside review of the program would also be useful. Taratec is looking now at what's happened to those projects that were funded in FY2000 and 2001, but that doesn't represent a full-scale independent evaluation.

#### **4) Ensure Ohio benefits**

By its very nature, the knowledge that lies at the heart of technology-dependent business may easily move not just across state boundaries, but national ones. A researcher lured to Ohio today could be elsewhere next year. Yet the state cannot afford to invest regularly in projects that move elsewhere and do not provide economic benefits. Evaluations now include whether proposals are attractive investments for the state, and the recent review of FY2004 grant proposals provided evidence that evaluators are paying some attention to whether award winners are likely to stay in Ohio (or, in the case of early-stage capital applicants, provide funding for Ohio-based companies).<sup>138</sup> However, such assessments should be explicitly required by the Department of Development. Moreover, the Third Frontier Commission must take them seriously.<sup>139</sup>

The department's addition of contract language requiring that grantees maintain their significant presence in Ohio and providing for payback when they do not is a welcome tightening of requirements that clearly had been too loose. The ability of grant recipients or their collaborators to receive funds from Ohio, only to leave the state, needed to be curtailed. Whether the recent addition of stricter language goes far enough – and specifically whether it covers a long enough period – should be monitored closely. All

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<sup>138</sup> 2004 Request for Proposals, p. 20. See evaluator comments on FY2004 applications.

<sup>139</sup> At its October meeting when the commission approved the FY2004 grants, for instance, it was informed that if a project of Cooling Technologies Inc. was successful, the company might be a takeover candidate, threatening its Ohio presence. The proposal was approved. Eager to boost bioscience investments in the state, the commission also backed such a fund (Cincinnati-based Triathlon Medical Ventures LLC) when no more than a quarter of the \$60 million it is raising is required to be invested in Ohio. Such a requirement was recommended by BizLogx as a condition of the grant. Originally, according to BizLogx comments on the proposal, the firm defined its region as the Midwest, without any specific Ohio investment threshold. See 2004 Third Frontier Action Fund, Proposal Evaluation Report Form, Triathlon Medical Ventures, LLC, Proposal # FA1-001, p. 2.

significant beneficiaries of the grants must be covered, whoever is the actual recipient, so that a future Cincinnati Machine is less likely to gain the benefits and use them elsewhere.

The state should require that grant recipients make and document efforts to see to it that products from inventions stemming from their grants be made in Ohio. If that is not commercially feasible, they could take them elsewhere.<sup>140</sup>

Venture funds that the state supports must primarily invest in Ohio. The Department of Development should include language in future RFPs and grant agreements explicitly prohibiting venture-fund investments that promote or accelerate the movement of jobs out of the state. Penalties for violating those provisions should be included. The Third Frontier Commission's annual report should include a description of how this was enforced and any violations that occurred.

### **5) Demand real competition**

Competition for contracts to evaluate TFAF grants has not consistently been adequate. The current TFAF evaluators may be highly qualified, but such vendors always must be chosen through real, effective competition if the program is to be credible. The Department of Development must do a better job of ensuring that.

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<sup>140</sup> The federal Advanced Technology Program includes a requirement that recipients not grant exclusive rights "to use or sell any subject inventions in the United States unless such person agrees that any products embodying the inventions will be manufactured substantially in the United States." In individual cases, this may be waived if it is shown that "reasonable but unsuccessful efforts have been made to grant licenses on similar terms to potential licensees that would be likely to manufacture substantially in the United States or that, under the circumstances, domestic manufacture is not commercially feasible." General Terms and Conditions, Advanced Technology Program, August, 2002, Section 25(b)7.  
<http://www.atp.nist.gov/alliance/gtc-0802.htm>

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