The Arkansas Science & Technology Authority

Report of the 1985 - 1987 Biennium

Prepared December 1, 1987
by the Staff
of the Arkansas Science & Technology Authority

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Report of the 1985-87 Biennium

Summary

The Arkansas General Assembly's implementation of Governor Bill Clinton's economic development plan of 1985 significantly changed the Arkansas Science & Technology Authority (ASTA). For instance, ASTA's budget for the 1985-87 biennium included its first program funds. In addition, the new legislation increased the size of ASTA's staff and reorganized its board of directors.

ASTA's four programs are:

Basic Research Grant Program, which seeks to build the state's scientific infrastructure and improve the ability of Arkansas research scientists to compete for awards at the national level by awarding grants to researchers at the state's colleges and universities;

Applied Research Grant Program, which pairs bright, capable researchers at Arkansas colleges and universities with industrial cosponsors in research partnerships demonstrating clear economic potential;

Business Incubator Program, which seeks to stimulate the development of new technology-based businesses and transfer of technology from universities to the private sector by the establishment of "incubator" facilities in cooperation with the state's publicly supported colleges and universities; and

Seed Capital Investment Program, which stimulates the creation of new technology-based enterprises by providing part of the start-up capital required by such firms.

Research- and technology-based economic development involve risk and require patience. But even by the end of their first two years' existence, ASTA's programs had already begun to show positive results.

Basic Research Grant Program

The Basic Research Grant Program awarded $621,362 to 18 projects. The National Institutes of Health has awarded one of the ASTA researchers $175,800 to continue his ASTA-funded research, and ASTA expects similar "returns" on its other investments in basic research.

One thrust of ASTA's basic research program has been to continue the Experimental Program to Stimulate Competitive Research (EPSCoR) of the National Science Foundation (NSF). Analysis of results from the Arkansas EPSCoR program, which sought to improve the quality of science and scientists in Arkansas, indicates that ASTA can expect a fivefold return on its basic research investment in the form of follow-up funds from federal and private sources.

Basic research drives science- and technology-based economic development. It creates new business opportunities and draws industry attention to the value of university problem-solving skills.

Applied Research Grant Program

The Applied Research Grant Program has awarded $246,867 to seven university research projects. Twelve industries served as partners in the projects by providing $363,447 in matching funds. This overall investment of $610,314 could have a multimillion dollar impact on the agricultural and manufacturing sectors of the Arkansas economy and spark the creation of a new biotech industry in the state.

Business Incubator Program

During the biennium, ASTA funded a statewide network of five business incubators. Three of the incubators have opened and house 11 tenant companies. These young, technology-based companies employ 41 Arkansans full time and one part time. The other two incubators, East Arkansas Business Incubator System (EABIS) at Jonesboro and The Business Center at Magnolia, are still under development.

The three operating incubators are Genesis at Fayetteville, North Arkansas Business Incubator System (NABIS) at Salem and Little Rock Technology Center. The University of Arkansas at Fayetteville and North Arkansas Community College at Harrison manage Genesis and NABIS, respectively, while the University of Arkansas at Little Rock and the city of Little Rock cooperatively operate

Little Rock Technology Center. Arkansas State University will manage the Jonesboro incubator, while Southern Arkansas University will manage the Magnolia incubator.

Seed Capital Investment Program

The Seed Capital Investment Program invested in two high-tech companies, both located in rural areas of the state. These two companies used ASTA's total investment of $300,000 to leverage $1,100,000 in other funding. They now employ 25 people.

One, Arkansas Technologies, Inc. (ARTECH) of Clarksville, will use computer-integrated technology and other technological innovations to design, manufacture, and install new flexible manufacturing systems and equipment; the other, Micoil Corporation of Conway, will use laser technology to manufacture thin-film inductor coils for customers in the electronics industry who use surface-mounted technology.

Other Assistance to Arkansas Businesses

During the biennium, ASTA initiated its Technology Transfer Program, which communicates the results of research efforts to interested businesses across the state. ASTA also provides assistance to those wishing to submit grant proposals to the federal Small Business Innovation Research (SBIR) Program. During the biennium, ASTA also helped two businesses submit proposals to NSF for funding.

ASTA: A National Role Model

ASTA's programs and results have made it a national model for research- and technology-based economic development. ASTA representatives have testified on science- and techology-based economic development legislation in Kansas and Nebraska and have provided input to such legislation in Oklahoma and Oregon.

ASTA represents Arkansas on the National Governors' Association's working group, State Initiatives in Applied Research, and has positioned itself to play a vital role in the federal policy-making process so that Arkansas directly benefits. It set up an informal state science policy task force in response to a congressional review of United States science policy, advocated inclusion of the National Center for Toxicological Research in the federal Technology Transfer Act of 1986, took a visible part in negotiations on the current trade bill and provided preliminary input to the Technology Policy Task Force of the U.S. Congress.

ASTA Provides Information

As part of its informational effort during the biennium, ASTA cosponsored "Winning the Race With Change," a conference on the role of science and technology in Arkansas' economic development. Representatives of both the public and private sectors attended this conference, which provided an unprecedented opportunity for the exchange of information between these groups.

ASTA initiated its communications plan during the biennium, establishing its quarterly newsletter (**The Authority Report**), expanding its slide and photo files and implementing a desktop publishing system.

Conclusion

ASTA's mission of bringing the benefits of science and advanced technology to the people of Arkansas continues to require a major commitment to research and development. This commitment involves taking risks and focusing on long-term results. Results documented in the literature and in other states amply demonstrate that a strong commitment to research and development will ultimately result in a dynamic and diverse Arkansas economy, providing more and better-paying jobs for the Arkansas work force.

12/1/87

Table 1 -- Basic Research Projects

The Arkansas Science & Technology Authority

Basic Research Projects during the 1985-87 Biennium

Project descriptions	Researchers	Amounts	Economic sectors
Development of genetic control of catfish growth & reproduction	Ernest Peck, Jr. & James W. Hardin, UAMS	$ 53,200	agriculture
Study of minerals affecting catfish nutrition	Delbert Gatlin, III, UAPB	16,242	agriculture
Study of stream resource management techniques	Arthur V. Brown, UAF	44,075	agriculture
Study of parasite transmission in bait fish	Stanley E. Trauth, ASU	18,971	agriculture
Development of new forest management instruments	James D. Wilson, UALR-GIT	24,695	agriculture, manufacturing
Development of building boards from rice hulls and whey	Tito Viswanathan, UALR	51,250	agriculture, manufacturing, sanitation, health services
Development of herbicide-resistant bermuda grass	John W. King & Feng H. Huang, UAF	30,010	agriculture
Development of laser instrumentation for medical and industrial diagnoses	Malay K. Mazumder, UALR-GIT	50,003	manufacturing, health services
Development of new laser material	Larry D. Merkle, UAF	47,500	manufacturing
Development of process for making chemical compounds with lasers	David L. Monts, UAF	14,898	manufacturing
Development of new chemical solvents	Norbert J. Pienta, UAF	24,615	manufacturing, mining, agriculture
Study of friction characteristics of a new brake design	D.A. Renfroe, UAF	77,816	manufacturing, transportation
Application of robotics in factory automation	Engin Yaz, UAF	25,181	manufacturing
Study of causes of complications in knee-joint injuries	Richard Webber, UAMS	51,330	health services
Development of instruments for early diagnosis of congenital hip disease	Paul C. McLeod, Jr., UALR-GIT	16,221	health services
Study of magnetic resonance imaging of metabolites or drugs	Richard A. Komoroski, UAMS	42,442	health services
Study of potential earthquake hazard to Enola, site of recent earthquake swarms	Roy B. VanArsdale, UAF	16,646	construction
Development of mathematical approach to modeling complex systems	Zdzislaw Jackiewicz, UAF	16,267	general services
		$621,362	

Table 2 -- Applied Research Projects

The Arkansas Science & Technology Authority

Applied Research Projects during the 1985-87 Biennium

Project descriptions	Industry sponsors	Sponsor's grant	ASTA's grant	$ Impact	Potential economic impact
Evaluation of causes for rice breakage during drying and storage	Riceland Foods, DICKEY-john Corporation, Abbott Laboratories	$ 8,000 16,720 10,000	$ 34,655	millions	This could save jobs and dramatically increase profits by improving rice quality.
Development of process for large-scale production of antibodies	Pel-Freez, Inc.	63,227	63,227	10 million/ year	This could create 150 to 500+ jobs and prompt Pel-Freez to build a new plant.
Development of poultry vaccine	Arkansas Poultry Federation	10,000	10,000	_____	This could protect millions of chickens from several killer viruses, saving jobs and profits.
Development of disease-resistant tomato plants	South Arkansas Fair & Marketing Assn., Bradley County Chamber of Commerce	7,500 3,000	10,500	1 million/ year	This could create 675 jobs and increase tomato yields by decreasing crop losses.
Development of disease-resistant spinach plants	Allen Canning Co.	164,000	49,610	6 million/ year	This could save 2,500 jobs and create 700 new ones by revitalizing the Arkansas spinach industry.
Evaluation of acid rain's potential damage to forest products industry	Weyerhaeuser Co.	31,000	31,000	potentially devastating	Acid rain may devastate the Ouachita Mountain forests; better information could suggest solutions.
Development of automated quality control inspection systems for assembly lines	Texas Instruments, Inc., Baldwin Piano & Organ Co.	45,000 5,000	47,875	decrease assembly costs	This could make Arkansas manufacturers more competitive and save 35 jobs.
		$363,447	$246,867		

Table 3 -- Business Incubator Projects

The Arkansas Science & Technology Authority

Business Incubator Program
during the 1985-1987 Biennium

Name	Sponsor	State Investment	Other Investment	Number of Businesses Per Cycle[1]	Average # of Jobs[2] Per Cycle
Genesis	University of Arkansas at Fayetteville	$550,000	$ 10,000	7-10[3]	28-40
East Arkansas Business Incubator System (EABIS)	Arkansas State University at Jonesboro	522,502	30,000	6-8	24-32
Little Rock Technology Center	University of Arkansas at Little Rock	300,000	400,000	30-40[4]	120-180
North Arkansas Business Incubator System (NABIS)	North Arkansas Community College at Harrison and town of Salem	138,000	0	3	12-18
Institute for New Enterprise Formation	Southern Arkansas University at Magnolia	327,498	1,000,000	5-6	20-30
		$1,838,000	$1,440,000	51-64	204-300

[1] An incubator's business cycle lasts two to three years, the average tenancy period of its client businesses.
[2] Job projections are based on an average of four to six employees per tenant business during the two- to three-year cycle.
[3] Genesis had four tenant businesses with 21 employees on June 30, 1987.
[4] The Technology Center had seven tenant businesses with 20 1/2 employees on June 30, 1987.

Table 4 -- Seed Capital Investment Projects

The Arkansas Science & Technology Authority

Seed Capital Investment Program during the 1985-87 Biennium

Arkansas Technologies, Inc. of Clarksville

Employment:

principals -- 3
start-up -- 5
present -- 20
projected for end of year 1 -- 22
projected for end of year 2 -- 45

ASTA investment: $150,000
Other sources: $500,000

Type of business: manufacturing (factory automation)

Business description: Using computer-integrated technology and other innovative technologies, ARTECH will design, manufacture and install new flexible manufacturing systems and equipment to help upgrade and modernize a business' manufacturing processes.

Targeted industries: defense, clay brick and ceramic tile, major appliances and local manufacturing companies

Micoil Corporation of Conway

Employment:

principals -- 1
start-up -- 2
present -- 5
projected for end of year 1 -- 12
projected for end of year 2 -- 30

ASTA investment: $150,000
Other sources: $600,000

Type of business: manufacturing

Business description: Laser technology will be used to manufacture a thin-film inductor coil for customers in the electronics industry who use surface-mounted technology.

Targeted industries: military and commercial electronics industries

Table 5 -- Seed Capital Investment Fund, Statement of Fund Balance

The Arkansas Science & Technology Authority

Seed Capital Investment Fund

Statement of Fund Balance
for the 1985-87 Biennium, which ended June 30, 1987

Investment	Amount
Certificates of Deposit	$1,595,000.00
Money Market Accounts	205,000.00
Interest earned	175,885.34
Nonrecurring expenses	(67.32)
Loans Outstanding	(150,000.00)
Interest earned	8,960.65
Principal earned	8,743.05
Investment Fund Cash Balance	**$1,843,521.72**

Table 6 -- Capital Improvement Funds, Statement of Fund Balances

Capital Improvement Funds

Statement of Fund Balances
for the 1985-87 Biennium, which ended June 30, 1987

Program	Funds Appropriated	Funds Available	Funds Awarded	Funds Paid
Research Programs Funds				
Basic Research Grants			$621,362	$602,552
Applied Research Grants			246,867	222,207
Total Research Program Funds	$1,800,000	$869,229	$868,229	$824,759
Business Incubator Program Funds	1,900,000	1,847,418	1,838,000	909,037
Total Capital Improvement Funds	**$3,700,000**	**$2,716,647**	**$2,706,229**	**$1,733,796**

Table 7 -- Government Fund Revenues and Expenditures, Comparative Statement

The Arkansas Science & Technology Authority

Comparative Statement of Goverment Fund Revenues and Expenditures for the 1985-87 Biennium

	FY1987	FY1986
Revenue:		
Revenue Appropriation	$559,558.00	$533,451.00
Deferments	(74,587.07)	(159,926.06)
Net Revenue Allocation:	**$484,970.93**	**$373,524.94**
Expenditures:		
Personal Services - Payroll	$203,696.27	$203,798.00
Employee Benefits - Matching	31,747.71	40,669.15
Communication - Postage	9,239.57	5,128.70
Printing, Advertising	5,836.97	4,742.67
Repairing, Servicing	1,387.87	775.58
Utilities, Rent	30,758.82	22,139.98
Travel, Subsistence	17,127.19	21,721.31
Professional Fees	41,653.12	26,838.64
Centrex Services	8,894.45	8,343.73
Conference, Convention Fees	8,322.00	2,710.00
Insurance, Bonds & Taxes	525.00	392.00
Publications, Office Supplies	7,498.56	6,369.67
Data Processing Software	1,938.05	2,249.79
Travel Fund	-0-	500.00
Capital Outlay - Equipment	11,498.73	21,689.98
Less Total Expenditures:	(380,124.31)	(368,060.20)
(Net Revenue Allocation Less Total Expenditures=) **UNSPENT ALLOCATION:**	**$104,846.62**	**$5,464.74**

Revenue Appropriation:	$559,558.00	$533,451.00
Less Total Expenditures:	(380,124.31)	(368,060.20)
UNSPENT APPROPRIATION:	$179,433.69	$165,390.80