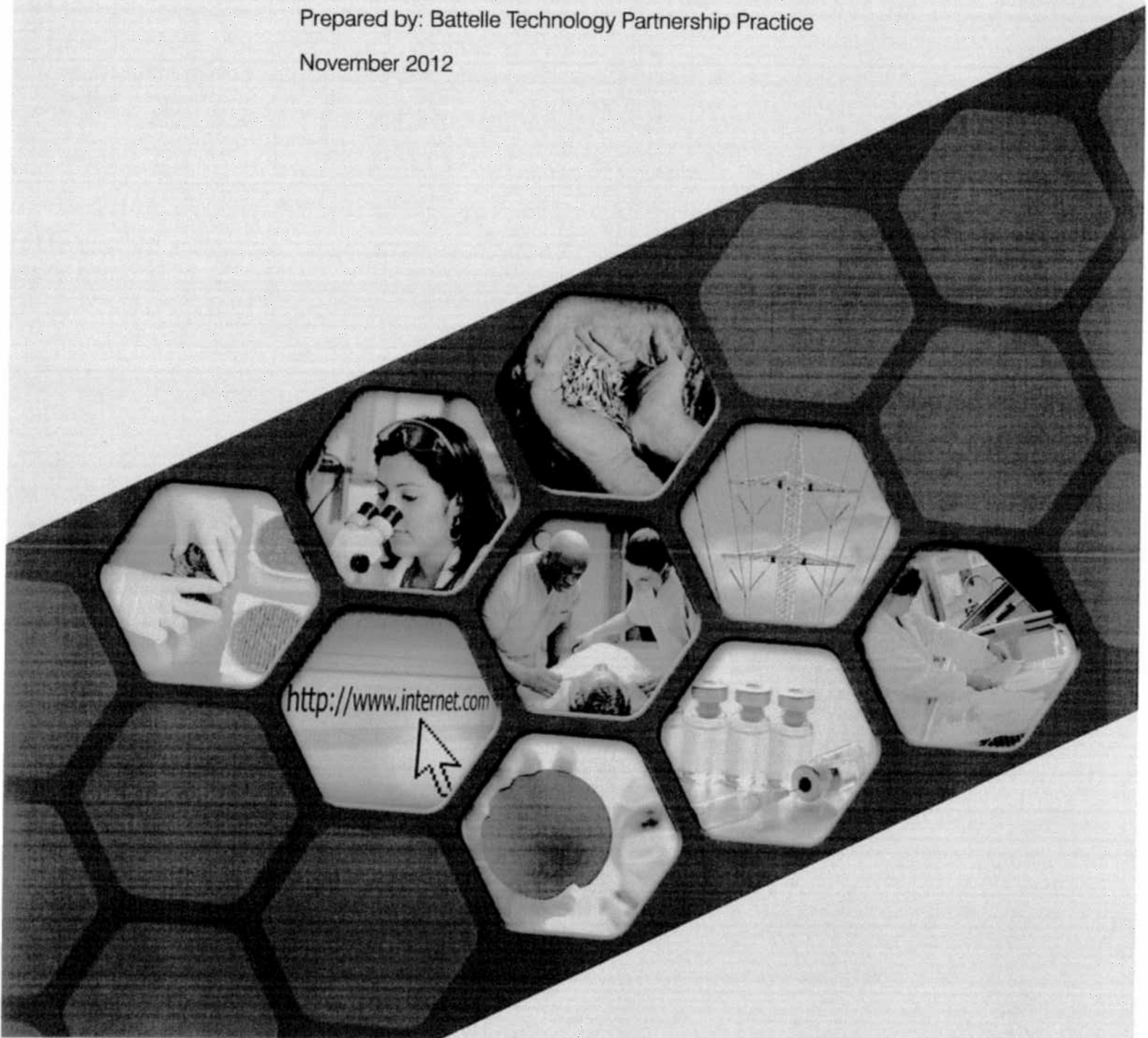


Arkansas' Knowledge Economy Initiatives: Analysis of Progress and Recommendations for the Future

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November 2012



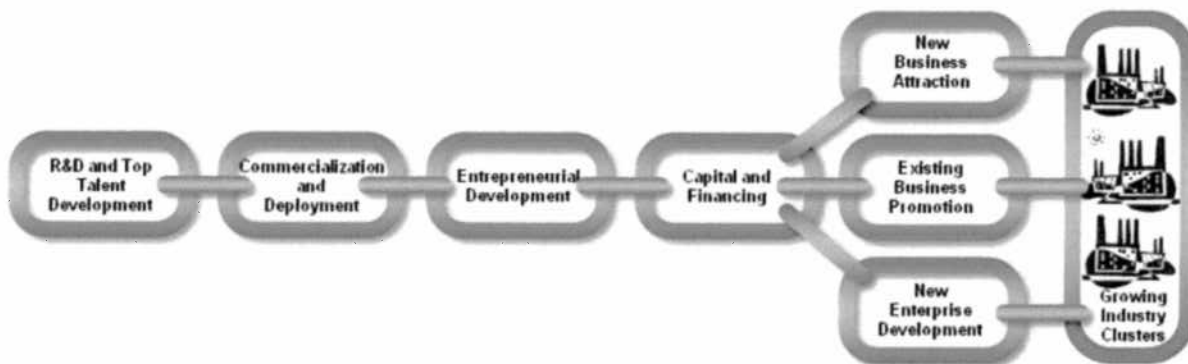
Executive Summary

In 2009, Governor Beebe announced a long-term, statewide economic plan to lead Arkansas in a transitional, systematic manner **to an economy supported by knowledge-based jobs to raise income levels and the standard of living for Arkansans**. Achieving success in knowledge-based economic development is a particularly complex and challenging goal. It requires having in place an interconnected value chain of economic development resources and services to develop and sustain economic growth.

By 2012, Arkansas had designed and implemented an interconnected program of economic development resources and services to develop and sustain its knowledge-based economy. It is a remarkable turnaround from the status of the state in 2004, as documented by the Milken Institute in its report to Accelerate Arkansas. The report, *Arkansas' Position in the Knowledge-Based Economy: Prospects and Policy Options*, noted that "Arkansas has been operating at the periphery of the knowledge-based economy,"¹ pointing out that while other states had been investing heavily and nurturing key institutions in the knowledge-based economy, Arkansas had not kept pace. In colloquial terms, Arkansas missed the boat.

By defining specific goals and formulating policies to promote the creation of knowledge-based jobs, Arkansas has been able to forge a value chain that links four critical activities: (1) R&D and top talent development, (2) commercialization and deployment, (3) entrepreneurial development, and (4) capital and financing. Successful integration of these activities is the key to Arkansas making significant progress in developing its business and technological competitiveness.

Figure ES-1: Links in the Knowledge-Based Economic Development Chain



Today, Governor Beebe and Accelerate Arkansas can take great satisfaction in the collaboration that is evident across key state agencies, including the Arkansas Economic Development Commission (AEDC),

¹ The Milken Institute, *Arkansas' Position in a Knowledge-based Economy*, 2004.

the Arkansas Science and Technology Authority (ASTA), and the Arkansas Development Finance Corporation. Arkansas has enjoyed clear economic benefits from activities to create a knowledge-based economy, and is now poised to take critical next steps to maintain momentum in this area.

Arkansas Currently Enjoys Clear Economic Returns From Existing Knowledge-Based Economy Initiatives

- ***Knowledge-based economy initiatives focused on research have received \$61.2 million in state funding from 2008 through 2011² and leveraged an additional \$191.8 million in non-state support.*** This represents an impressive return on state dollars invested in research: for each \$1 in state funding the Arkansas programs have leveraged an additional \$3.14. The economic multiplier effects related to leveraged non-state research funds amounted to \$335 million in total economic output to the state and supported 2,820 job years over the period 2008 to 2011. These research-focused initiatives offer a foundation upon which Arkansas can grow its knowledge economy, bringing new technology capacities to the state, generating top talent among faculty, graduate students and postdoctoral fellows and providing opportunities for spin-off companies.
- ***Arkansas' knowledge-based economy activities have worked in concert since 2008 to assist 135 emerging companies, directly employing 1,259 workers.*** The full economic multiplier impact of these emerging companies participating in the state's commercialization/deployment, entrepreneurial development, and capital/financial initiatives is a total of 3,251 jobs throughout the Arkansas economy. These direct jobs created by emerging companies are found in industries offering significantly higher wages than the private sector average wage in Arkansas—on average over \$70,000 a year. This is more than double the \$34,014 average annual wage of the private sector in Arkansas.
- ***The Arkansas economy is being bolstered overall by growth in high-wage, typically knowledge-intensive industries.*** Job gains from 2007 to 2010 in these high-wage industries amounted to just over 6,000 jobs, which generated total employment impacts of 11,800 jobs. Over this same period of time, Arkansas experienced a decline in total private industry jobs.

Arkansas is Poised to Take Critical Next Steps

Although Arkansas enjoys economic returns from its current initiatives, that alone does not indicate a successful transition to a knowledge-based economy. **What Arkansas lacks today is a sustainable funding mechanism providing adequate, predictable resources for knowledge-based economy initiatives.** Many of the newly enacted knowledge-economy initiatives depend upon discretionary funding under the General Improvement Fund for support. The uncertainty of year-to-year funding through the General Improvement Fund is a major handicap. This lack of a sustainable funding

² The focus of the analysis generally encompasses 2008 through 2011 activities though data were reported to Battelle on a fiscal year basis by program area and there are some differences in time periods reported by program. Two programs, ASTA and ARA, reported data through FY 2012; ABI reported data through FY 2011.

mechanism is not new to Arkansas. It was a matter of great concern identified in Governor Beebe's 2009 Strategic Plan for Economic Development.

While job creation, direct and indirect, is a positive indicator, much work remains to be done to achieve a successful transition to a knowledge-based economy. Specific needs and challenges in services identified through the economic analysis by Battelle and consultations with key stakeholders are summarized below.

- ***Raising the value-added component along with the productivity of Arkansas industry is a major challenge for existing companies*** – Proven approaches to address this need include advancing industry–university partnerships to raise the deployment of technologies and shift to more innovative products.
- ***Lack of formal private equity investment in Arkansas may choke off the potential of growth-oriented emerging companies*** – Proven approaches to address this need include enlisting more established serial entrepreneurs able to win the confidence of venture capitalists in Arkansas, and advancing an Arkansas-based venture capital entity able to make seed and early stage formal venture capital investments and syndicate with national venture capitalists for later stage investments.
- ***Putting the state's growing resource pool of talent to work*** – Proven approaches to address this need include creating incentives for Arkansas industry to hire and create internships with top talent being generated in Arkansas, and furthering university entrepreneurial education and training at the undergraduate and graduate levels.

The key areas of focus for bringing existing programs up to scale and aligning new programs to the goal of advancing knowledge-based economic development in Arkansas are summarized below.

- ***Research:*** Attain a higher level of per capita university research funding
- ***Commercialization:*** Accelerate the formation of emerging knowledge-based economy companies and position them for success
- ***Investment:*** Realize the growth potential from emerging companies that have participated in the existing knowledge-based economy initiatives
- ***Top Talent:*** Put talent to work in Arkansas

Based on specific activities associated with these four areas, an annual funding level of \$25 million is recommended in General Revenue Funds to support the knowledge-based economy initiatives in Arkansas. The chart below provides a summary of the goals and corresponding initiatives.

Proposed Recommendations for Sustainable Funding and Enhancements to Arkansas' Knowledge Economy Initiatives		
Goals	Initiatives	Proposed Annual General Revenue Fund Request
Research: Attain a higher level of per capita university research funding	Ramp-up in ARA Scholars More ASTA funding for young investigators Continued matching grants for federally funded research centers Industry-university partnership matching grants Signature shared use research and applications development facilities	\$10 M in annual funding
Commercialization: Accelerate the formation of emerging knowledge-based economy companies and position them for success	Continue base support for existing initiatives: Innovate Arkansas, Risk Capital Matching Fund, ASTA Tech Development grants, ASTA Tech Transfer Assistance Grants, ASTA Seed Capital Investment Augment Innovate Arkansas for more intensive mentoring and outreach to funding sources Establish a university technology commercialization/proof of concept funding	\$7 M in annual funding
Investment: Realize the growth potential from emerging companies that have participated in the existing knowledge-based economy initiatives	Partial state funding and tax credits towards creation of a \$20 million to \$30 million Arkansas-based, privately managed early stage investment fund Resources for advancing stronger management teams → consider an Entrepreneur in Residence approach	\$7 M in annual funding (The state partial funding and incentives for creating a privately managed early stage seed investment can also be effectively done through a one time appropriation)
Top Talent: Put talent to work in Arkansas	Incentives for post-secondary internships with Arkansas industry Talent bridges for doctorate and post-doctoral level science and engineering graduates to industry. Further statewide university entrepreneurial education and training, targeting STEM graduate and undergrads	\$1 M in annual funding