Report on
RESEARCH AND ECONOMIC COMPETITIVENESS
Prepared for the CPE Strategic Agenda Work Group

Introduction

Innovation is the driving force behind a global, 21st century economy. Through research and development, our universities create the knowledge that is the foundation of innovation. By commercializing this research, universities create new businesses and jobs that capitalize on Kentucky's strengths and expertise, while faculty and staff educate our current and future workforce to high levels. This educated workforce, in turn, attracts more educated people to the region, prospective employers and employees alike. In short, our postsecondary system is a key driver of economic development.

The Kentucky General Assembly understood the importance of research to economic development when it passed the *Postsecondary Education Improvement Act of 1997*, commonly known as HB1, which calls on the University of Kentucky to become a top 20 public research institution and for the University of Louisville to be a nationally recognized metropolitan research university by 2020. The comprehensive universities were to develop nationally recognized programs of distinction or applied research programs and serve their regions through outreach and service. The Kentucky Community and Technical College System was to raise the skills of Kentucky's workforce and meet the needs of employers through education and training programs.

Research and economic competitiveness are common themes in HB1 and a main focus of the 2011-15 strategic agenda planning process. The CPE has worked with partners to identify members of the Research and Economic Competitiveness Subgroup, comprised of representatives from the Council on Postsecondary Education, Kentucky's postsecondary education institutions, the Kentucky Science and Technology Corporation, the Cabinet for Economic Development, the Education and Workforce Development Cabinet, the Coalition of Senate and Faculty Leadership, the Committee on Equal Opportunities, and the Kentucky business community. A list of members appears in Appendix A.

The group met twice during the summer of 2010. At the first meeting on May 29th, Ron Crouch of the Cabinet for Education and Workforce Development provided insight into Kentucky's occupational outlook over the next five to six years. Deborah Clayton of the Cabinet for Economic Development explained her agency's role in stimulating high-tech business development. And Matt Garvey of the Kentucky Science and Technology Corporation explained his organization's efforts to build an environment for the entrepreneurial development of science and technology companies. Bob King, President of CPE, facilitated the meeting with co-chairs Phyllis Maclin and Nancy McKenney. During the meeting, all members had the opportunity to contribute ideas on ways the state can foster research and further economic development efforts.

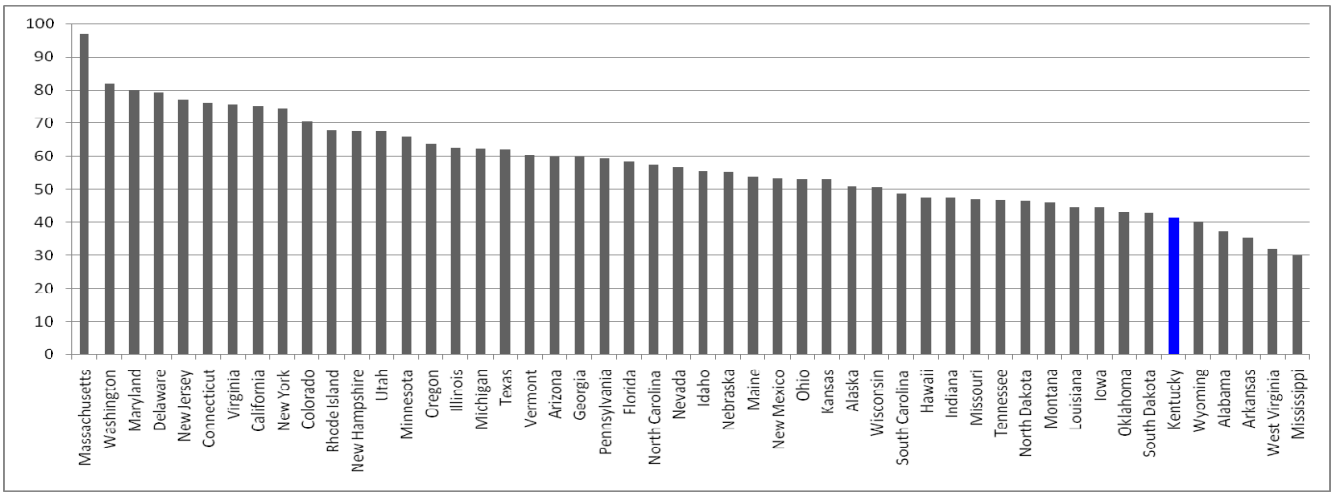
The second meeting on June 24th focused on identifying specific objectives related to research and economic competitiveness and prioritizing strategies for each of these objectives. Members discussed the merits of each objective and the strategies necessary to achieve the objectives.

Problem Overview

Postsecondary education plays a central role in transforming Kentucky's economy and quality of life. Through expanded research and development, faculty and staff expertise, the commercialization of research, and degree and credentials clearly linked to immediate and future workforce needs, colleges and universities can spur the state's economic growth and development. Just as important, Kentucky's postsecondary institutions must be good "stewards of place," working with community leaders to advance economic, social, cultural, and environmental progress.

The current environment, however, presents a few challenges. Kentucky's per capita personal income of $31,936 in 2008 ranked 48th in the nation.[1] Part of this can be attributed to the lack of educational credentials of our workforce. More than half of the workforce has a high school diploma or less, while just under half (45 percent) has completed some college (associate degree or less) but not a bachelor's degree.

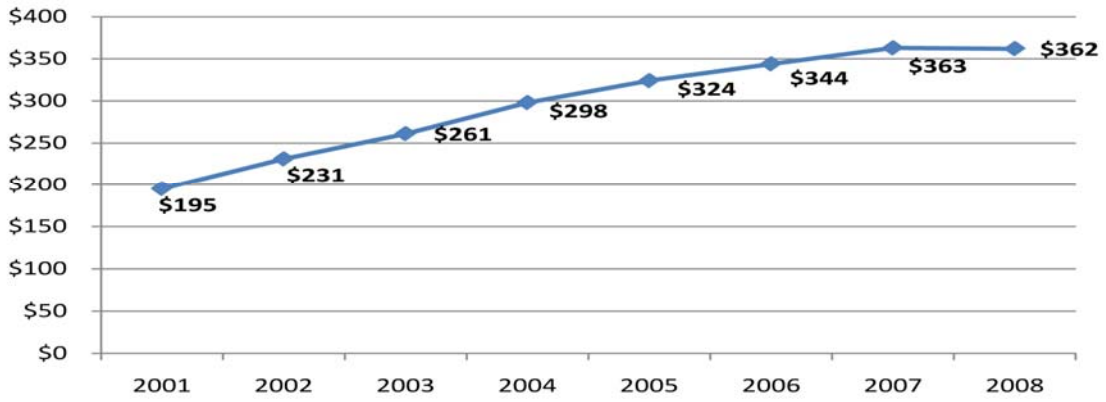
Kentucky Ranks 45th in the U.S. on the New Economy Index



Source: Atkinson and Andes, 2008

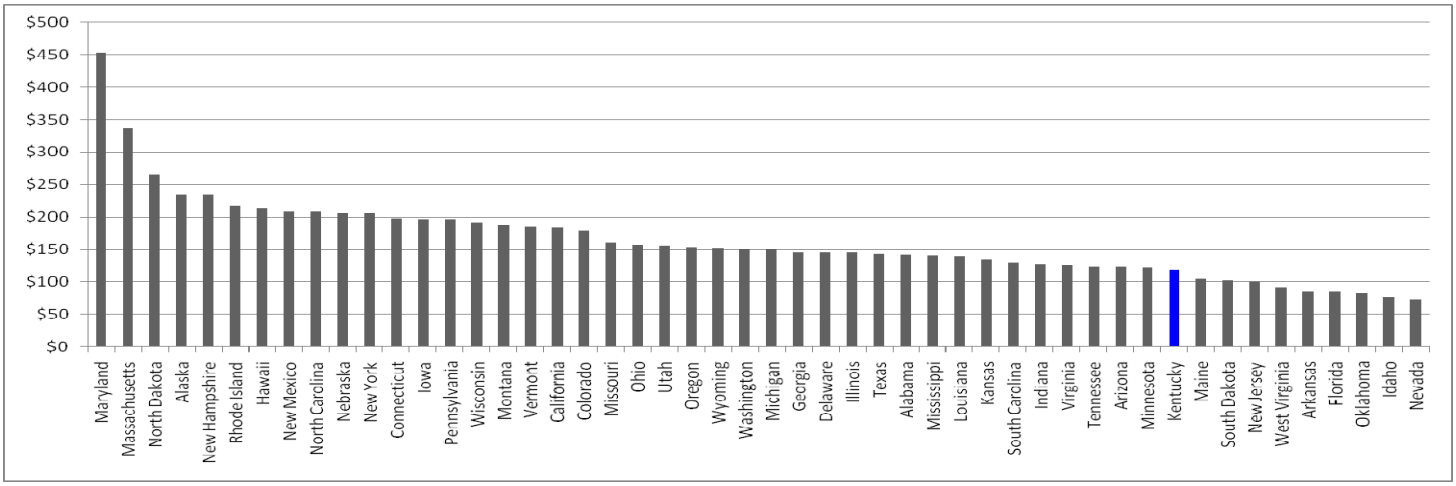
There is much work to be done to make Kentucky a high-performing, knowledge-based economy. The state currently ranks 45th in the nation on the New Economy Index, which consists of 29 indicators grouped by five categories: knowledge jobs, globalization, economic dynamism, digital economy, and technological innovation capacity.[2] In terms of individual categories in the index, Kentucky made great strides in "information technology jobs," moving from 42nd place in 2002 to 33rd place in 2008; Kentucky also moved from 42nd in 2007 to 25th in 2008 in "entrepreneurial activity." Kentucky is ranked 2nd in the nation in terms of "e-government," an increase from 32nd place in 2002. These data show that Kentucky has strengths in the New Economy on which to build.

Extramural R&D Expenditures at Kentucky Universities, in Millions



Source: National Science Foundation Survey of Research and Development Expenditures at Universities and Colleges

Kentucky's Annual Per Capita Postsecondary Expenditure on R&D ($119)



Source: National Science Foundation and U.S. Bureau of the Census, 2007

Despite a low overall New Economy Index ranking, Kentucky has made significant progress in growing its research and development capacity since the beginning of postsecondary reform. Extramural R&D expenditures at all public universities, for instance, increased almost 86 percent, from $195 million in 2001 to $362 million in 2008.[3] Nevertheless, in total R&D expenditures (which includes both extramural and institutional funds), Kentucky ranks 41st in the United States.[4]

Recent Statewide Strategies and Initiatives

Kentucky has a number of statewide initiatives aimed at promoting research and economic competitiveness. These initiatives focus attention and resources on enhancing R&D, economic competitiveness, and quality of life.

Regional Stewardship Program

The Regional Stewardship Program, which began in 2006, promotes regional and statewide economic development, livable communities, social inclusion, creative governance, and civic participation through public engagement activities initiated by comprehensive university faculty and staff. Its purpose is to link the resources and knowledge of our universities to the needs and challenges of their respective regions.

Infrastructure funds are used to develop and maintain organizational structures, personnel, information systems, advisory committees, and external partnerships necessary to sustain stewardship activities. Regional grant funds are used to recruit and retain full-time faculty or professional staff in areas of strategic benefit to a service region or the state, as identified in an institution's strategic plan for regional stewardship and its priority area proposal.

As part of the Regional Stewardship Program, each comprehensive university has created an office dedicated to coordinating and expanding engagement efforts with partners in their regions. In addition, the institutions are developing expertise and programs to address issues ranging from early childhood education to small business development to promoting STEM initiatives.

STEM Task Force

The CPE created a STEM Task Force in 2006 to develop a strategic action plan focused on science, technology, engineering, and mathematics. The 110-member task force issued eight recommendations to advance Kentucky's STEM disciplines. The General Assembly formalized the task force through KRS 164.0287 and charged it with creating an implementation and business plan for the eight recommendations. The STEM II task force, comprised of 60 members, developed four strategies:

- Promote public awareness and promotion through development of a STEM communications framework.
- Expand Kentucky's STEM talent through Project Lead the Way, AdvanceKentucky, and Primary Mathematics Implementation Programs to provide successful teacher preparation and student learning.
- Utilize lessons learned from math achievement and assessment work already developed and expand like models into science and technology curricula.
- Expand successful programs currently in place in Kentucky, such as Northern Kentucky

University's Center for Integrative Natural Science and Mathematics (CINSAM) and Teach Kentucky, to increase recruitment and build teacher retention.

Bucks for Brains

HB 1 created the Strategic Investment and Incentive Funding Program or "trust funds" that enabled state appropriations to finance the Bucks for Brains program at Kentucky's public universities. The program requires universities to match appropriated state funds with donations from philanthropists, corporations, foundations, and other nonprofit agencies. Public and private matched funds are invested, and the earnings are used to fund faculty positions, research, special programs, or scholarships. The invested principal remains untouched in order to provide a perpetual source of funding.

Current guidelines specify at least 70 percent of program funds at the University of Kentucky and the University of Louisville and at least 50 percent at comprehensive universities must support programs or disciplines in five new economy priority areas: human health and development, biosciences, materials science and advanced manufacturing, information technologies and communications, and environmental and energy technologies.

Between 1998 and 2004, the Kentucky General Assembly appropriated $350 million to the Bucks for Brains Program. Of that amount, $300 million was allocated to the state's two research universities, and $50 million was allocated to the state's six comprehensive universities. When fully matched with private giving, this represents $700 million that has been added to the endowments of the state's public universities. In addition to these funds, the 2008 General Assembly authorized $50 million in General Fund supported bond funds in 2008-09 for the Research Challenge Trust Fund to support the Endowment Match Program and a newly created Research Capital Match Program. That same year, it authorized $10 million in bond funds for the Comprehensive University Excellence Trust Fund to support the Bucks for Brains program or to fund capital projects at the comprehensive universities. The governing board members at participating institutions have the flexibility to determine how these funds will be used. There is a dollar-for-dollar matching requirement regardless of the option chosen.

As the chart below shows, Bucks for Brains has been a hugely successful program. It has arguably done more to advance the standings of Kentucky's research universities than any other statewide strategy.

Analysis of Bucks for Brains: UK and UofL Combined (dollars in millions)

Indicator	1997	2000	2003	2006	2009
Annual Giving	$87.7	$92.5	$87.6	$ 128.6	$ 122.9
Endowment Market Value	$447.4	$823.9	$887.5	$ 1,465.4	$ 1296.6
Endowed Chairs	53	125	164	199	227
Endowed Professors	49	136	201	256	292
Federal R&D Expenditures	$75.6	$91.6	$159.9	$ 221.7	N/A

Extramural R&D Expenditures	$105.2	$147.1	$249.5	$ 327.4	N/A
Invention Disclosures Received	70	94	92	157	163
New Patent Applications Filed	33	50	52	43	91
Licenses & Options Executed	6	16	17	31	31
Active Licenses & Options	59	67	77	142	201
Start-Up Companies Formed	0	6	2	11	20

Source: CPE Data

Knowledge-Based Economy Initiatives

The *Kentucky Innovation Act of 2000* was designed to propel Kentucky in its pursuit of knowledge economy, educational, and employment opportunities. Through a contract with the Kentucky Science and Technology Corporation (KSTC), CPE supports several initiatives designed to stimulate research and development, university and business collaboration, and rural involvement in the knowledge economy.

Since 2001, KSTC has administered knowledge-based economy investments. Below are cumulative performance highlights of this effort based on investments made under nationally competitive due diligence and professional expert reviews of applications requesting over $155M from FY 2002 through FY 2009:

- 1,286 Investments (in 590 companies and 14 postsecondary institutions across 73 Kentucky counties)
- $72.4 million invested
- $682.9 million in follow-on investments
- 71 active contracts with negotiated payback terms
- $3.3 million return on investment from exits and conversions by 23 companies
- 5,108 jobs created
- 1,129 intellectual property actions (patents, invention disclosures, trade secrets, copyrights, trademarks).[5]

EPSCoR

In addition to these statewide programs, Kentucky participates in the cooperative national program, Experimental Program to Stimulate Competitive Research (EPSCoR). EPSCoR is designed to enhance the research and intellectual capacity of universities and colleges by building and coordinating strategic investments in human capital and physical infrastructures to make Kentucky institutions more competitive in federal research funding opportunities.

Four of the six active EPSCoR federal programs require state matching funds for research awards. The Kentucky EPSCoR research infrastructure seeding program supports the pursuit of federal research awards by providing grants for human infrastructure development, some of which require

institutional matching funds. Small seeding program grants are available to encourage collaboration among researchers. All EPSCoR funding support requires a commitment to submit proposals for R&D funding. CPE oversees this program, which is administered by the Kentucky Science and Technology Corporation.

As a requirement for EPSCoR, states must have a coordinated science and technology plan. Kentucky's current plan, which is coordinated by the Kentucky Science and Technology Corporation, focuses on education. Current priorities include promoting a culture of research and innovation, improving educational opportunities, and building technology and research.

Since 1985, Kentucky has been awarded $340 million in federal, state, university, and industrial funding that has been leveraged through EPSCoR programs, and the state has received more than $186 million in federal EPSCoR research funding since 2000.[6]

Department for Commercialization and Innovation

The *Kentucky Innovation Act of 2000* established The Office of the Commissioner for the New Economy, reorganized in 2005 as the Department of Commercialization and Innovation (DCI). DCI administers the Kentucky Innovation and Commercialization Center Program and funds proposals to support the growth and creation of R&D and high tech companies in five technology focus areas: human health and development, information technology and communication, biosciences, energy and environmental technologies, and materials science and advanced manufacturing.

In the last four years, DCI has awarded 40 high-tech companies a total of $15,429,528, with projected job creation of 871. The Innovation and Commercialization Center Programs—which help entrepreneurs, scientists, and engineers build high-tech business strategies—helped start 400 companies since 2007, which have generated $1.013 billion in sales revenues, created 2,173 jobs, and generated state payroll tax revenues of $6,429,002.[7]

Targeted Research Initiatives

In addition to the broader initiatives outlined above, Kentucky also has programs targeted specifically at cancer research and homeland security.

Cancer Research

The *Cancer Research Trust* is funded by a portion of cigarette excise tax revenues and is disbursed to UK and UofL through a 1:1 match program. In an effort to improve both morbidity and mortality from all cancers, the Cancer Research Trust funds are utilized to encourage the combined efforts of Kentucky researchers in clinical and translational research through early detection and the disease continuum through end of life, with epidemiological studies and applications of best practice in the diagnoses and treatments of all cancers. Achieving critical benchmarks—including earning the

designation of a National Cancer Institute Comprehensive Cancer Center— is a major goal and within the scope of the Strategic Plan for both universities' cancer centers. In order to receive this designation, UK and UofL must demonstrate a strong research base with well-integrated programs in each of the three major research areas of basic, translational, and clinical science.

The Kentucky General Assembly of 2000 established the *Lung Cancer Research Fund* utilizing a portion of the state's tobacco settlement funds. This 20-year initiative encourages the combined efforts of UK and UofL in lung cancer translation and clinical research, early detection and epidemiology initiatives, and the development of the Kentucky Clinical Trial Network. The Kentucky Clinical Trial Network is a statewide alliance of physicians conducting trials in the prevention, early detection, and treatment of lung cancer. The network conducts both investigator-initiated and industry- sponsored trials.

The National Institute for Hometown Security

Through management of the Kentucky Critical Infrastructure Protections Program, the National Institute for Hometown Security fosters collaborative research and development among postsecondary institutions and helps researchers commercialize their products. All of Kentucky's public postsecondary institutions are members of this consortium, and many Kentucky researchers are engaged in research related to the national security issues.

Proposed Statewide Objectives and Strategies

Kentucky must build on past success and ramp up its research and development efforts to compete effectively in the global economy. The educational attainment level of our workforce needs improvement, and degree production should be aligned with the workforce needs of the state. In addition, Kentucky's postsecondary institutions must continue to engage in partnerships with community leaders to advance economic, social, cultural, and environmental progress to improve the state's quality of life, an overarching objective of HB 1. With these challenges in mind, the members of the Research and Economic Competitiveness Subgroup developed the following objectives and strategies to advance research and development in the state and ultimately improve the quality of life in the Commonwealth.

Objective 1: To increase research and development efforts to promote innovation and economic development.

Kentucky has made great strides in research and development since the passage of HB1, but other states are making progress as well. Over the next five years, the subgroup recommends focusing on the following strategies in order to maximize research and development resources and increase competitiveness with other states and nations.

Potential Strategies

- **Focus the state's investment in a few emerging areas where Kentucky has the best chance of developing global expertise.**

  Individual Kentucky institutions have developed particular strengths and areas of expertise that shape their strategic research agendas and funding priorities. A study of lessons learned from exemplary technology transfer practices found that … "just as important as the absolute magnitude of a university's research portfolio is its strategic focus."[8] By identifying core competencies, universities can target faculty hires, federal grant applications, and corporate-sponsored research.

  At the same time, the economic development prospects of the state would be advanced if Kentucky were able to develop a few niche areas in the new economy. DCI has identified five broad priority areas, which include human health and development, biosciences, materials science and advanced manufacturing, information technologies and communications, and environmental and energy technologies. Within those five areas, DCI has identified animal health, neuroscience and rehabilitative medicine, and clean energy as "fast-start" areas in which there is a sizeable amount of university research, industry presence in Kentucky, and national and international demand on which to build and develop international expertise.

  In addition, there is a "growing recognition of the need to promote multi-institutional, multi-disciplinary research."[9] Because of the limited resources in the state, collaborative research between UK and UofL should be encouraged, as well as collaboration among the two research institutions and the comprehensive universities. Partnerships are key. Faculty can partner across disciplines and departments as well as with other public and independent universities and the private sector in order to maximize the state's R&D potential.

- **Develop a communications and marketing plan that highlights current research and development efforts as well as future plans.**

  There is a great deal of research underway with great potential for growth, but potential investors, entrepreneurs, and the general public may not be aware of these projects. By raising public awareness of the research that is underway, Kentucky can become known as a hot spot for R&D.

  By highlighting the important work going on at our universities as well as the companies that have been formed as a result of this research, the state can reap many benefits. Kentucky can publicize the need to cultivate intellectual capital to create a 21st century "talent force" and grow knowledge-based economy jobs within the Commonwealth. A public awareness campaign would increase student knowledge of STEM career possibilities and possibly encourage students

to pursue careers in STEM and other high-demand fields. A public awareness campaign would also help market Kentucky as a place to invest or start knowledge-based businesses.

- **Encourage undergraduate and graduate research, co-op, internship, and work-study opportunities in STEM-related and other high- demand fields.**

  Graduate and undergraduate research opportunities as well as co-op, internship, and work study opportunities can help students become more engaged on their campuses and more involved in the STEM disciplines. Undergraduate research opportunities, for example, help students understand the research process and how to conduct a research project,[10] which can give them an advantage in graduate school. Undergraduate research projects can also increase students' interest in obtaining a Ph.D. and pursuing a STEM-related career.[11]

  Co-op, internship, and work study opportunities can provide similar benefits to undergraduates. Students who work in STEM-related companies or in STEM-related jobs on campus, for instance, can learn a great deal about research and STEM careers. Co-op, internship, and work study opportunities also allow employers to create a pipeline of potential employees and build other relationships with campuses.

  CPE could help coordinate partnerships among research universities, comprehensive universities, KCTCS, and AIKCU institutions to allow students from these colleges and universities the opportunity to engage in research and work activities across institutions.

- **Advocate for sustained funding for the Bucks for Brains program.**

  Bucks for Brains has proven to be a well-placed investment, successfully recruiting high-profile faculty who have attracted significant levels of externally funded research to Kentucky. Because of its success, Kentucky should continue to invest in the Bucks for Brains program to the extent that resources are available, perhaps with a preference for investments that develop identified research niches for the state.

  CPE could re-evaluate or expand the program guidelines to ensure that Bucks for Brains is maximizing research opportunities. Guidelines, for example could be expanded to create matching funds for research dollars from private and federal sources. In order to grow their R&D capacity, universities need both office space and lab space for researchers. CPE could examine the possibility of expanding program guidelines to consider such issues as increasing capital investment to address space needs or including doctoral and post-doctoral recruitment.

Potential Metrics

- Total research expenditures
- Extramural research expenditures
- Research expenditures per capita
- Number of patents secured
- UK Top 20 public research university status
- UofL premier metropolitan research university status

Objective 2: To encourage entrepreneurship as a driving force of job creation.

Research and development must be commercialized in order to create economic growth. To start companies based on university R&D, universities can either broker deals with entrepreneurs in the private sector, or researchers can become entrepreneurs and take their ideas to market.

Potential Strategies

- **Encourage efforts to promote an entrepreneurial culture within university campuses.**

  "The entrepreneurial culture of a university is perhaps the strongest and most pervasive influence on its technology transfer and commercialization performance."[12] Universities can help create an entrepreneurial culture by hiring faculty with entrepreneurial experience, providing support for faculty interested in pursuing business opportunities, and rewarding faculty who commercialize their research.

  Universities with strong technology transfer programs often have strong entrepreneurship programs that include STEM students, not just business students.[13] Activities that promote and encourage entrepreneurship include business plan competitions, internship opportunities in start-up companies, and mentoring of students and faculty by successful entrepreneurs.

  CPE can help identify best practices, communicate those best practices to Kentucky's public institutions, and facilitate conversations and lessons learned among university representatives as they build entrepreneurial cultures on their campuses.

- **Expand and upgrade existing technology transfer centers and business incubators to commercialize university research and development.**

  Universities have traditionally established technology transfer offices to broker licensing deals with entrepreneurs. But universities can also locate entrepreneurs and partner them with university researchers or help university researchers become entrepreneurs.

Incubators provide inexpensive office space and infrastructure, but they also provide mentors, technical assistance, and other guidance that is critical to business start-up success. They can provide marketing and public relations support, networking opportunities, and educational opportunities.

CPE can work with universities to identify best practices and evaluate university offices of technology transfer in terms of those best practices. CPE could work with institutions to develop statewide standards for technology transfer offices, as well as facilitating partnerships between UK, UofL, and comprehensive universities to broaden access to a wide array of specialized commercialization services. CPE could also examine the feasibility of creating a centralized technology transfer/intellectual property office that could be shared by all comprehensive universities.

- **Build industry clusters in identified areas of strength.**

The *Kentucky Innovation Act of 2000* provides support for industry clusters, and DCI has identified five priority areas and three "fast-start" areas with the greatest potential for growth. While there may be emerging clusters in the state, there are currently no well-identified, well-established industry clusters with which Kentucky is identified.

By focusing on industry clusters, Kentucky postsecondary institutions can target their commercialization efforts and build entrepreneurial expertise in certain industries. This would not preclude commercialization of ideas in other areas, but it would simply highlight certain industries with the greatest potential.

CPE can work with the Cabinet for Economic Development, KSTC, postsecondary institutions, and other partners to identify clusters and provide informational resources to postsecondary institutions about how to enhance these potential clusters.

- **Identify, coordinate, and help market entrepreneurial resources.**

"One of the simplest means of ensuring that entrepreneurs receive assistance that they need is to ensure that they know what resources are available to them."[14] DCI, KSTC, Small Business Development Centers, and other organizations provide valuable resources to emerging entrepreneurs. However, entrepreneurs may not be aware of these resources and how to access them.

CPE, for instance, could work with partners to identify these resources and help establish a resource clearinghouse. This clearinghouse could be publicized as part of the communications and marketing plan to promote research and development in the state.

Potential Metrics

- Enrollment/degrees in formal entrepreneurship programs
- Number of business start-ups
- Number of jobs created from these start-up businesses

Objective 3: To align education, economic development, and workforce policies and programs to develop, attract, and maintain jobs.

While there are formal partnerships in place, the CPE can lead efforts to enhance partnerships among postsecondary education, workforce development, and economic development. Stronger partnerships will lead to better outcomes and more efficient use of state resources.

Potential Strategies

- **Evaluate the *Kentucky Innovation Act of 2000* to assess the policy's effectiveness and make recommendations for any updates or revisions to the legislation.**

  The *Kentucky Innovation Act* created several pools of funding for research and development and knowledge-based enterprises, and many of the programs fall under the purview of the CPE. The CPE and partners should evaluate these programs, make recommendations for any changes, and potentially focus these funds on the niche areas identified as Kentucky's strengths.

- **Assess whether current and projected degree production matches up with current and projected job openings.**

  CPE should work with institutions to ensure that the postsecondary sector is attuned to workforce needs while understanding the importance of the liberal arts. Institutions must play a part in economic development efforts by helping educate employees with the skills and training demanded by current and potential employers. CPE and partners can work together to better understand workforce trends and how they should impact degree production at the institutions.

  While institutions should ensure that they are graduating people with the skills and degrees required by employers, it is also important to increase opportunities for underrepresented populations. Institutions should strive to recruit students from underrepresented groups in order to create a diverse pool of applicants for the knowledge-based economy jobs that are necessary to move the state forward economically.

  One way of emphasizing the importance of workforce demand at the state level is through the Council's program approval and program review processes. For instance, employer demand for graduates of a certain program could be an important criterion in the review of new academic

programs, while employer satisfaction with graduates could provide valuable information in the periodic review of existing academic programs.

- **Focus scholarships on high-need workforce areas.**

  In order to increase the number of students pursuing academic programs in high-demand fields, the state could direct scholarship money to these disciplines if new funding were available. These scholarships might attract more underrepresented students to STEM areas, for example, thereby helping to ensure diversity and close opportunity gaps. Promoting these scholarships in high schools and other organizations could raise awareness of certain academic programs and potentially increase the number of students interested in pursuing degrees in these fields.

Potential Metrics

- Number of degrees in high-demand fields (STEM, health, etc.) at different degree levels
- Graduate school enrollment and degrees
- Gap between degrees/credentials produced within system and forecasted jobs by industry and educational attainment requirements
- Workforce assessments and training
- Job placement and/or income of Kentucky public postsecondary education graduates

Objective 4: To foster partnerships to address Kentucky's most pressing quality of life issues.

Knowledge-based workers are looking for vibrant communities with a high quality of life. Good schools, good parks, and cultural amenities are important considerations that factor into decisions about where to locate. In order to attract a larger number of educated workers, Kentucky must address some of the social, economic, health, and environmental issues that plague the state.

As the CPE fosters partnerships among postsecondary institutions, government, businesses, and nonprofit organizations, we must take into consideration that quality of life issues vary by population and that solutions to these issues must address the needs of a diverse group of people.

Potential Strategies

- **Identify one or two major quality of life issues that the state will prioritize for the next five years.**

  Just as universities should target their research and development investments in areas of greatest strength, the state should consider focusing on a small subset of quality of life issues where new investments and partnerships could be targeted for maximum effect. These

partnerships could create synergies that maximize both state and private investment in addressing these quality of life issues.

The CPE could help coordinate efforts among state government, nonprofit organizations, the private sector, and postsecondary institutions to identify and prioritize the most pressing quality of life concerns.

- **Support faculty research and outreach in these areas, help coordinate inter-institutional efforts, and identify and connect partner organizations that can help address these problems.**

  While much research and outreach is being done on quality of life issues at colleges and universities, these efforts are not well coordinated or publicized at the state level. The CPE could help identify research and outreach efforts underway at each institution, identify partnership opportunities, and facilitate the creation of collaborative research, projects, or activities.

  The CPE could identify and catalog research and outreach programs related to these priority areas. The CPE could also coordinate meetings and distribute information among the partner organizations, playing an important role as a broker of information and relationships.

Potential Metrics

- Regional stewardship in target areas TBD (health, education, etc.)
- Research performed in target areas TBD (health, education, etc.)

Appendix A
Members of the Research and Economic Competitiveness Subgroup

Chair: Nancy McKenney, Faculty Representative, Council on Postsecondary Education

Terry Allen, Associate Vice President for Institutional Equity, University of Kentucky, Campus Diversity Coordinator Representative

Rodney Andrews, Director, Center for Applied Energy Research, University of Kentucky

Deborah Clayton, Commissioner, Department of Commercialization and Innovation, Kentucky Cabinet for Economic Development

Gary Cox, President, Association of Independent Kentucky Colleges and Universities (AIKCU)

Nancy Cox, Associate Dean for Research in the College of Agriculture, University of Kentucky

Ron Crouch, Director of Research and Statistics, Office of Employment and Training, Kentucky Education and Workforce Development Cabinet

Mason Dyer, Director of Communications and Research, Association of Independent Kentucky Colleges and Universities (AIKCU)

Blaine Ferrell, Dean, Ogden College of Science and Engineering, Western Kentucky University

Jan Hillard, Associate Provost for Regional Stewardship, Northern Kentucky University

Kyle Kenney, Partner, Keeney and Ulrich

Kris Kimel, President, Kentucky Science and Technology Corporation

Marilyn Lyons, Senior Associate, Kentucky Adult Education

Phyllis Maclin, CPE's Committee on Equal Opportunities Representative

J. Marshall, Executive Director Regional Engagement, Morehead State University

Jack B. Matthews, Senior Vice President/Director of Business Development, Wells Fargo Insurance Services USA, Inc.

Peg Munke, Coalition of Senate and Faculty Leadership (COSFL) Chair

William Pierce, Interim Executive Vice President for Research, University of Louisville

Jerry Pogatshnik, Dean, Graduate Studies, Eastern Kentucky University

David Randall, University of Kentucky, Coalition of Senate and Faculty Leadership (COSFL) Representative

Ken Robinson, Deputy Commissioner, Department for Business Development, Cabinet for Economic Development

Mary Stephens-Frazier, Director, Office of Sponsored Programs, Kentucky State University

Hollie Swanson, University of Kentucky, Coalition of Senate and Faculty Leadership (COSFL) Representative

Jim Thompson, Information Specialist, Kentucky Adult Education

James Tracy, Vice President for Research, University of Kentucky

Jeff Whitehead, Executive Director EKCEP Local Workforce Investment Board (LWIB), Kentucky Adult Education Partner

Christina Whitfield, Director of Research and Policy Analysis, Kentucky Community and Technical College System

Gina Winchester, Executive Director of Regional Stewardship, Murray State University

Endnotes

[1]U.S. Bureau of Economic Analysis and Bureau of the Census. March 2010. *State Personal Income 2009*. Data retrieved on June 17, 2010 from http://www.bea.gov/newsreleases/regional/spi/spi_newsrelease.htm.

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[4] Calculated from data from the National Science Foundation and the U.S. Bureau of the Census.

[5] Kentucky Science and Technology Corporation. September 2009. *2009 Annual Report on Investments*.

[6] Kentucky Science and Technology Corporation. September 2009. *Annual Update, KY EPSCoR*.

[7] Kentucky Department of Commercialization and Innovation, Kentucky Cabinet for Economic Development. 2009. *2009 Annual Report to Governor Steve Beshear, the Legislative Research Commission and the Kentucky Innovation Commission*.

[8] Palmintera, Diane. February 2005. *Accelerating Economic Development Through University Technology Transfer*. Reston, VA: Innovation Associates, p. ix.

[9] State Science and Technology Institute. August 2006. *A Resource Guide for Technology-based Economic Development Positioning Universities as Drivers Fostering Entrepreneurship Increasing Access to Capital*. Prepared for the Economic Development Administration, U.S. Department of Commerce, p. 14.

[10] Russell, Susan H., Hancock, Mary P., and McCullough, James. April 27, 2007. Benefits of Undergraduate Research Experiences. *Science,* vol. 316.

[11] Ibid.

[12] Palmintera, Diane. February 2005. *Accelerating Economic Development Through University Technology Transfer*. Reston, VA: Innovation Associates, p. x.

[13] Ibid.

[14] State Science and Technology Institute. August 2006. *A Resource Guide for Technology-based Economic Development Positioning Universities as Drivers Fostering Entrepreneurship Increasing Access to Capital*. Prepared for the Economic Development Administration, U.S. Department of Commerce, p. 38.