



WEST VIRGINIA BLUEPRINT FOR
TECHNOLOGY-BASED ECONOMIC DEVELOPMENT

EXECUTIVE SUMMARY

March 2009



A report from: **TechConnectWV**
West Virginia Coalition for Technology Based Economic Development

With consultation and assistance from:
Battelle Technology Partnership Practice

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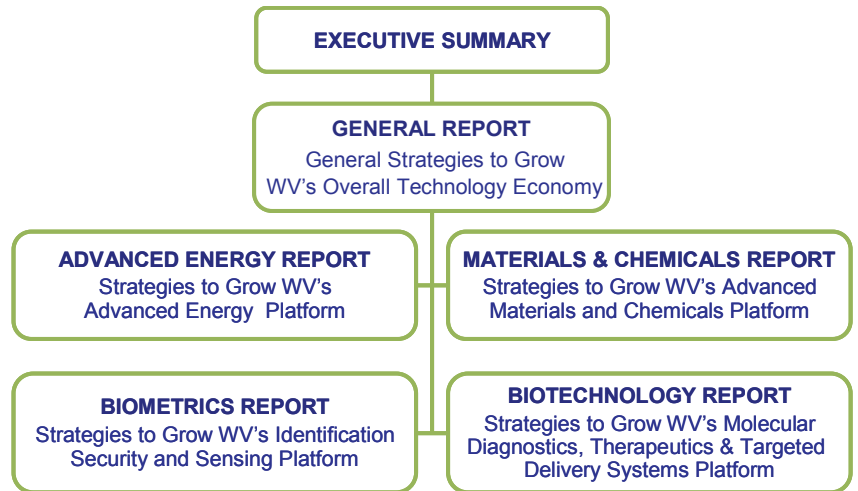
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HOW THIS REPORT IS ORGANIZED

This report represents Phase II of West Virginia's Technology-Based Economic Development (WV's TBED) Blueprint. In 2007, Battelle Technology Partnership Practice produced the Phase I report entitled *Gap Analysis and Identification of Strategic Technology Platforms*.

The Phase II study is organized into six distinct reports:

- 1. Executive Summary** — Provides a synopsis of introductory and background material, general strategies and actions for growing West Virginia's technology economy, and specific strategies and actions for growing West Virginia's Advanced Energy and "Biometrics" (Identification, Security, and Sensing Technology) sectors
- 2. General Report** — Includes the Executive Summary, but also provides detailed introductory and background material and detailed information on the general strategies and actions for growing West Virginia's technology economy
- 3. Advanced Energy Report** — Provides detailed information on the specific strategies and actions for growing West Virginia's Advanced Energy sector
- 4. "Biometrics" Report** — Provides detailed information on the specific strategies and actions for growing West Virginia's Identification, Security, and Sensing Technology sector
- 5. Advanced Materials and Chemicals Report** — Provides detailed information on the specific strategies and actions for growing West Virginia's Advanced Materials and Chemicals sector
- 6. "Biotechnology" Report** — Provides detailed information on the specific strategies and actions for growing West Virginia's Molecular Diagnostics, Therapeutics, and Targeted Delivery Systems sector



The general strategies and actions represent broad recommendations for West Virginia's overall technology economy. They are common activities and tasks that will boost TBED in West Virginia independent of and across all technology areas.

Conversely, the specific sector strategies and actions are recommendations explicitly targeted to four, pre-identified technology strength areas in West Virginia. They represent those activities and tasks that will enhance those particular technology platforms.

Thus, the general strategies and actions are common to all four technology sectors and to other technology areas as well.

While many of the specific sector strategies and actions are unique to particular technology areas, there are common or similar recommendations and thus overlap among the

technology platforms. Likewise, there are some common recommendations and overlap between the general and specific sector strategies and actions as well.

As of March 2009, the first four of the six reports have been completed. However, TechConnectWV plans to develop strategies and actions for the other two technology platforms — (1) Advanced Materials and Chemicals and (2) Molecular Diagnostics, Therapeutics, and Targeted Delivery Systems — over the coming months.

*This report is the **EXECUTIVE SUMMARY** only.*

This report and all other reports can be found at:
www.TechConnectWV.com

EXECUTIVE SUMMARY

Battelle Technology Partnership Practice and TechConnectWV have identified **specific strategies and actions** to accelerate the growth of technology-based economic development (TBED) in West Virginia (WV). Successful implementation of the recommended strategies and actions will not only help grow West Virginia's innovation economy, but will **boost its overall economy** as well, fueling economic growth, increasing the standard of living across the state, and creating **more jobs and higher-paying jobs** for West Virginia's citizens.

TBED is an economic imperative. Multiple studies show that a state's economic success can be largely attributed to the growth of high-technology businesses, not only lifting the economy but diversifying it as well.

There can be no doubt that TBED is a critical component of West Virginia's economic future.

West Virginia has historically had an economy built on energy, chemicals, and natural resources.

More recently, the state has made strides in building a technology economy with, among others, significant federal labs, an emerging biometrics presence in north-central West Virginia, a strong information technology industry in the eastern panhandle, and a growing technology base in Charleston.

Importantly, the state's major research universities, Marshall University (MU) and West Virginia University (WVU), have increased their emphasis on technology transfer, commercialization, and entrepreneurial activities. New start-up firms are sprouting in West Virginia; and the state's recent investment in research, the Research Trust Fund, will support those efforts, helping both universities attract top-notch scientific talent with an entrepreneurial approach.

Still, although there is much to be proud of and much to build from in West Virginia, the state is admittedly far behind most of its counterparts both in the region and around the country. In fact, West Virginia ranked 49th in the 2008 *State Technology and Science Index* produced by the Milken Institute. **Although West Virginia is making strides, it continues to face challenges** in growing its technology industries and transitioning its economy to one based on innovation.

Implementation of this Blueprint will help ensure West Virginia becomes a leader in TBED, providing **solid, sustained economic growth** for the state and its citizens **well into the 21st century**.

"With over 18,000 technology jobs that pay, on average, **\$53,325 a year**, 9% of the jobs in [north-central WV] are technology industry jobs. Perhaps even more significant is that these jobs **account for 16% of all wages** paid in the region, a clear indication that **[the technology] industry offers higher wages** than others do."

North-Central West Virginia's Technology Industry: A Pathway Through the 21st Century

Blueprint Phase I: West Virginia's Gaps and Strengths

This report represents Phase II of WV's TBED Blueprint. In **2007**, **Battelle Technology Partnership Practice** produced for the WV Vision Shared TBED Team, the precursor to TechConnectWV, a report entitled *Gap Analysis and Identification of Strategic Technology Platforms*. That report was Phase I of the Blueprint. Using extensive qualitative and quantitative analyses, Battelle examined West Virginia's innovation economy and determined its competitive position for TBED. Specifically, Battelle **uncovered key gaps** that need to be overcome and **uncovered key strengths** that can be exploited to enhance West Virginia's position.

In the 2007 study, Battelle found four key gaps in West Virginia's technology economy.

A fifth gap was uncovered while conducting focus groups for the present study.

Those five gaps, illustrated in Figure ES-1, are as follows:

1) Talent – world-class technicians, skilled workers, scientists, engineers, executives, and other professionals at all levels

2) Early-Stage Seed Capital – risk capital that entrepreneurs, small businesses, and start-up firms must have to succeed and grow

3) Entrepreneurial Know-How – “serial entrepreneurs” who have successfully started and grown several technology companies and who can act as role models or mentors for aspiring entrepreneurs

4) Image – negative stereotypes of West Virginia that persist and impact the state's ability to raise capital, recruit talent, and attract technology companies

5) Leadership – an organization to provide overall guidance, direction, facilitation, and broad leadership for the entire TBED effort across the state.

West Virginia's strengths were categorized into two areas:

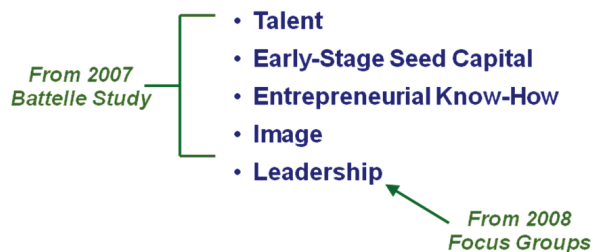
1) general competitive advantages (in text box at right)

2) specific technology strengths.

Based on an extensive analysis to determine those technology strengths, **Battelle recommended four technology platforms for West Virginia:**

- Advanced Energy and Energy-Related Technology
- Advanced Materials and Chemicals
- Identification, Security, and Sensing Technology (Biometrics)
- Molecular Diagnostics, Therapeutics, and Targeted Delivery Systems (Biotechnology).

Figure ES-1. Identified Gaps in WV's TBED Infrastructure



West Virginia's General Competitive Advantages

- ✓ Presence of a large number of nonprofit and federal research institutions
- ✓ Growing academic research base
- ✓ Increased focus on tech transfer and commercialization at MU and WVU
- ✓ Growing technology sector, particularly in North Central West Virginia
- ✓ Highly productive workforce
- ✓ Quality college graduates
- ✓ Growing entrepreneurial support infrastructure
- ✓ Quality of life that is attractive to many people

These represent the areas where West Virginia has the best chance of developing a robust technology economy. These are the areas where West Virginia — meaning the universities, federal labs, nonprofit groups, state and local government, economic development groups, and private companies in the state — can most likely collaborate to create new companies and new jobs and significantly expand and diversify the state's economy.

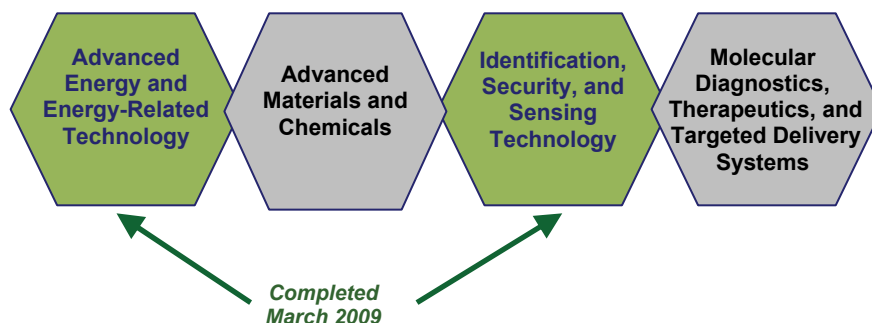
Although West Virginia should concentrate on these four technology areas where the state is already strong, it should still conduct and support research, development, and innovation in other technology areas. Significant economic and job growth could — and, with systemic improvements in WV's TBED structure, should — occur even in nonplatform areas.

As of March 2009, TechConnectWV has dedicated resources and **developed specific strategies and actions for two technology platforms** (Figure ES-2):

- ✓ **Advanced Energy** and Energy-Related Technology
- ✓ Identification, Security, and Sensing Technology (**Biometrics**).

These represent nearer-term opportunities based on West Virginia's capabilities and both state and national goals. However, TechConnectWV plans to develop strategies and actions for the other two platforms over the coming months.

Figure ES-2. West Virginia's Technology Platforms



Development of West Virginia's Strategies and Actions

As of March 2009, Battelle and TechConnectWV have developed three sets of strategies and actions to address the findings in the Phase I report:

1. Strategies and actions addressing **West Virginia's Gaps**
2. Strategies and actions capitalizing on West Virginia's strengths in **Advanced Energy** and Energy-Related Technologies
3. Strategies and actions capitalizing on West Virginia's strengths in Identification, Security, and Sensing Technology (**Biometrics**).

Working with TechConnectWV, Battelle crafted an initial set of strategies with specific actions using the following key sources of information:

- Findings from the Phase I Battelle report
- Various West Virginia–based research, planning, and strategy reports
- In-depth one-on-one interviews with key leaders
- In-depth conversations with TechConnectWV staff and Executive Committee
- Focus groups conducted around the state
- Focus groups conducted with technology platform leaders
- Battelle’s broad experience and expertise.

Battelle Technology Partnership Practice

- Includes **leading analysts and practitioners** in TBED.
- Helps clients **develop, implement, and evaluate technology strategies**, policies, and programs
- **Serves non-profit technology groups**, economic development groups, and universities across the U.S.
- **Builds collaboration** among business, higher education, and government groups **to stimulate economic growth**

TechConnectWV

- **Coalition of professionals** dedicated to growing and diversifying WV’s economy by advancing TBED
- A **501(c)3 non-profit** corporation with broad membership from the private and public sector
- Serves mainly as **facilitators**, enhancing awareness and increasing collaboration to **spur technology commercialization** in WV
- Partners with the WV Development Office to provide WV’s TBED strategy and to support initiatives
- The trade name for the **West Virginia Coalition for Technology-Based Economic Development, Inc.**

The **initial set** of strategies and actions was then **vetted** with a number of stakeholder and **leadership groups in West Virginia**.

Suggested changes were funneled back to Battelle for **further scrutiny**; and, after much interchange, a **final set** of strategies and actions was developed.

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General Strategies and Actions for Boosting West Virginia's Technology Economy

Four strategies and 18 actions are proposed to address the general or overall needs in West Virginia and its gaps in TBED. The strategies are shown in Figure ES-3 and described below.

Figure ES-3. Overview of General Strategies and Actions

Build a culture that supports innovation and entrepreneurship	Grow WV's technology clusters around the targeted technology platforms	Ensure access to capital at all stages of firm development	Promote a proactive business climate
<ul style="list-style-type: none"> Support and expand TechConnect WV Support and expand a statewide network providing comprehensive commercialization services and support to technology entrepreneurs and early-stage start-up companies Encourage the state's universities to continue to increase support for technology transfer and commercialization Create a university-industry matching grant program Publicize and celebrate TBED success 	<ul style="list-style-type: none"> Continue to provide support for the WV Research Trust Fund Establish an Innovation Institute Program focused on the technology platforms Form technical networks around each of the platform areas 	<ul style="list-style-type: none"> Provide funds to match SBIR and STTR Phase I awards received by WV companies Increase funding for INNOVA's seed and early-stage investment fund Use tax credits to make capital available to early-stage technology companies Attract venture fund investments in WV technology companies 	<ul style="list-style-type: none"> Invest in technology infrastructure, including research parks, incubators, and laboratories Maintain the state's refundable R&D tax credit and Economic Opportunity Tax Credit Develop a branding and marketing strategy that builds on the technology and location strengths of WV Identify and build awareness of 21st Century Skills Facilitate and expand talent recruitment efforts Undertake a communications campaign

STRATEGY ONE Build a culture that supports innovation and entrepreneurship and the creation and growth of technology-based companies

Innovation, in and of itself, will not necessarily translate into economic activity. Rather, it is the application of a technology and its introduction into the marketplace that result in economic growth. Facilitating TBED and supporting entrepreneurs and the growth of entrepreneurial companies is therefore a critical component of any state's or region's strategy to accelerate the growth of its technology-based economy.

STRATEGY TWO Grow West Virginia's technology clusters by building R&D and commercialization capacity around the targeted technology platforms

To compete in today's economy, a state must have both sources of technology and a way to bring that technology to the marketplace. A strong presence of research institutions — including universities, national laboratories, and nonprofit research institutions — is critical

for states seeking to grow technology-based economies. It is no less important to also have an infrastructure in place that supports the commercialization of research findings.

**STRATEGY
THREE**

Ensure access to capital at all stages of firm development

Entrepreneurs, start-up firms, and small companies must have access to financing for each stage of development, from early-stage, proof-of-concept, and prototype development to venture financing. One characteristic shared by leading technology regions is that they are home to a venture capital community committed to early-stage local investment.

**STRATEGY
FOUR**

Promote a pro-active business climate with incentives that will grow, attract and retain technology-based companies

Technology companies — with assets more intellectual than physical — are not well-suited to traditional economic incentive programs. Instead, key business climate factors for TBED include costs of doing business (tax structure, public sector policy), technology infrastructure (research parks and incubators), quality of life (low-cost housing, recreation, arts, and culture), and general business leadership (experienced and active leaders engaged in the innovation economy).

The strategies and actions are summarized in Table ES-1. Actions marked critical have the greatest priority, although some may take several years to accomplish. Immediate actions should be undertaken in the first year of implementation. Short-term actions should be undertaken in 1 to 3 years and mid-term actions in 3 to 5 years.

Table ES-1. General Strategies and Actions Proposed for West Virginia

STRATEGY ONE		Build a culture that supports innovation and entrepreneurship and the creation and growth of technology-based companies		
ACTION	PRIORITY	TIMEFRAME	LEAD ORGANIZATION	RESOURCES
Action 1: Support and expand TechConnectWV	Critical	Immediate	TechConnect WV	\$250,000 annually
Action 2: Support and expand a statewide network providing comprehensive commercialization services and support to technology entrepreneurs and early-stage start-up companies	Critical	Immediate	INNOVA and WV Small Business Development Center (WVSBDC)	\$500,000 annually
Action 3: Encourage the state's universities to continue to increase support for technology transfer and commercialization	High	Immediate	TechConnect WV	Included in TechConnectWV budget
Action 4: Create a university-industry matching grant program	Medium	Mid-Term	WV Higher Education Policy Commission (WVHEPC) and WV Development Office (WVDO)	\$500,000 annually
Action 5: Publicize and celebrate TBED successes	Medium	Short-Term	TechConnectWV and WVDO	Included in TechConnectWV budget

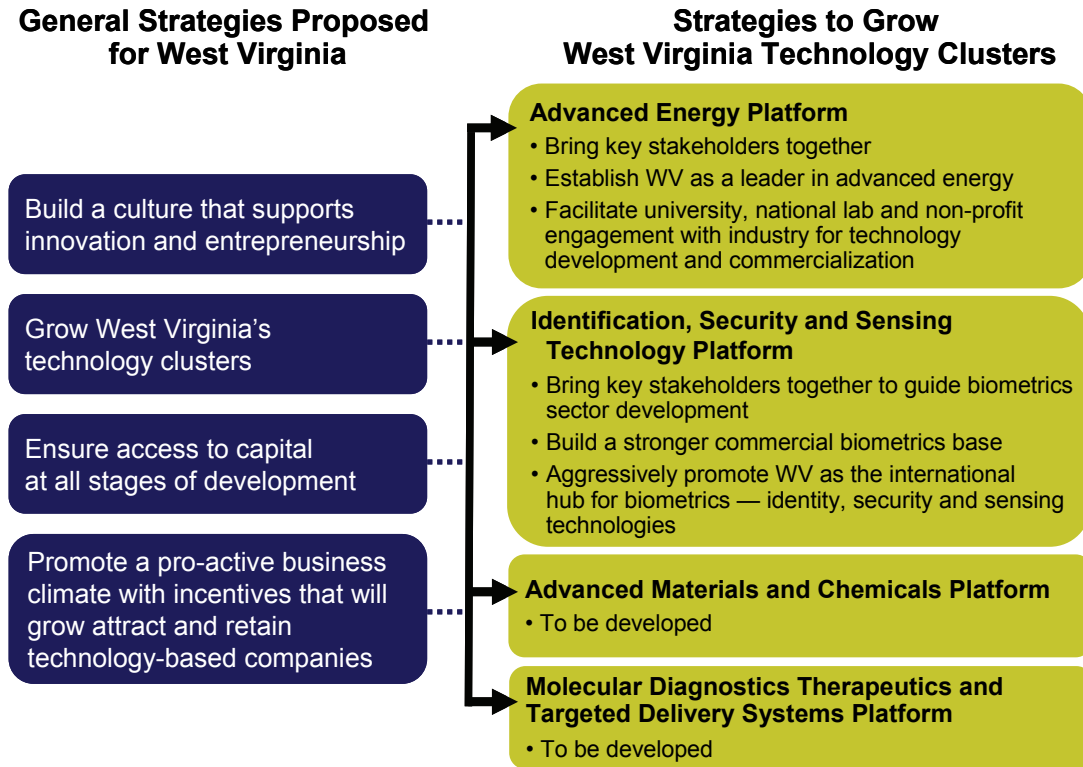
STRATEGY TWO		Grow West Virginia's technology clusters by building R&D and commercialization capacity around the targeted technology platforms			
ACTION	PRIORITY	TIME FRAME	LEAD ORGANIZATION	RESOURCES	
Action 6: Continue to provide support for the WV Research Trust Fund, which supports both faculty recruitment and development of research infrastructure	Critical	Immediate	WVHEPC	Annual investments to achieve \$180 million (cumulative) by 2015	
Action 7: Establish an Innovation Institute Program focused on the technology platforms that would fund people, equipment, and facilities and create proof-of-concept funds to support cluster development projects	High	Short-Term for plans Mid-Term for Institute Short-Term for Proof-of-Concept (PoC) Funds	WVHEPC, WVDO and TechConnectWV	Initial program grants of \$250,000 per Institute Approximately \$25 million per Institute over multiple years \$500,000 for PoC Funds scaled up to \$1 million to \$2 million over time based on demand	
Action 8: Form technical networks around each of the platform areas	High	Short- to Mid-Term	TechConnect WV	Staff support could be included in the TechConnectWV budget Alternatively, \$35,000 per year for part-time support	

STRATEGY THREE		Ensure access to capital at all stages of firm development			
ACTION	PRIORITY	TIME FRAME	LEAD ORGANIZATION	RESOURCES	
Action 9: Provide funds to match SBIR and STTR Phase I awards received by WV companies	Critical	Immediate	WVSBDC and INNOVA	\$700,000 in FY 2010 to be increased as the number of SBIR awardees increases	
Action 10: Increase funding for INNOVA's seed and early-stage investment fund	Critical	Immediate	INNOVA	\$5 million annually, with a minimum of \$5,000 and maximum of \$250,000 per award	
Action 11: Use tax credits to make capital available to early-stage technology companies	High	Immediate	WV Angel Network	Cap of \$2 million annually for the High Growth Business Investment Tax	
Action 12: Attract venture fund investments in West Virginia technology companies	Medium	Mid-Term	TechConnectWV	Included in TechConnectWV budget	

STRATEGY FOUR		Promote a proactive business climate with incentives that will grow, attract, and retain technology-based companies			
ACTION	PRIORITY	TIME FRAME	LEAD ORGANIZATION	RESOURCES	
Action 13: Invest in technology infrastructure, including research parks, incubators, and laboratories	High	Short- to Mid-Term	WVDO, Universities, WV HEPC, TechConnectWV	To be determined	
Action 14: Maintain the state's refundable R&D tax credit and Economic Opportunity Tax Credit for specified taxpayers	High	Immediate	TechconnectWV and WVDO	Existing resources	
Action 15: Develop a branding and marketing strategy that builds on the technology and location strengths of WV	Medium	Short-Term	WVDO	\$250,000 to \$500,000 for outside firm Or existing resources	
Action 16: Identify and build awareness of 21st century skills needed to support TBED and future workforce needs of the state's technology industries	Medium	Mid-Term	WORK-FORCE WV Department of Education, WVHEPC	Existing resources	
Action 17: Facilitate and expand talent recruitment efforts	High	Immediate	WVDO with support from TechConnectWV, Create WV, and Generation WV	Existing resources	
Action 18: Undertake a communications campaign to increase understanding of the technology economy and the opportunities it will provide to West Virginians	High	Short-Term	WVDO with support from TechConnectWV and Create WV	Included in budget for branding and marketing campaign	

In addition to the overall strategies and actions, a set of proposed strategies and actions was developed for two of the four technology platforms (Figure ES-4). These sector specific strategies are outlined below.

Figure ES-4. Overview of Cluster Strategies and Relationship to Overall Strategies



Strategies and Actions for Advanced Energy Platform



Three strategies and 12 actions are proposed to grow West Virginia's energy economy. The strategies are briefly described below.

	ENERGY STRATEGY ONE	Bring key stakeholders together to guide advanced energy sector development
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West Virginia contains multiple organizations, groups, and businesses engaged in various aspects of energy R&D, energy resource development, energy production and distribution, and energy regulation. Several organizations have recently produced plans or strategies targeting energy-based development in the state. These organizations must work together, and the various strategies must be aligned — if not integrated — to drive West Virginia's energy economy well into the 21st century.

	ENERGY STRATEGY TWO	Establish West Virginia as a leader in advanced energy
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Energy has become a leading economic issue for the nation as well as a critical concern for domestic energy security, global climate change, and environmental protection. Although alternative energy sources and technologies are important and should be a key area of emphasis in West Virginia, fossil fuels are not going to be replaced any time soon. They are plentiful and comparatively inexpensive; but, new technologies for recovery, production, and use and environmental mitigation must be developed to sustain the fossil fuel industry and meet national goals. Clearly, with the state's energy strengths — its vast energy resources, strong energy industry, and robust energy research — **West Virginia is in a favorable position to become a global leader for advanced energy.**


	ENERGY STRATEGY THREE	Facilitate university, national lab, and non-profit engagement with industry for technology development and commercialization
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Although basic research is essential and often leads to significant commercial products, processes, and services, successful TBED usually occurs more readily from industry and market-driven initiatives. Thus, the Advanced Energy Platform will greatly benefit from proactive industry engagement, cooperation, and collaboration. In fact, it is Battelle's experience that the discovery and commercial implementation of solutions rapidly accelerate when such cooperation occurs.

The energy strategies and actions are summarized in Table ES-2. Actions marked critical have the greatest priority, although some may take several years to accomplish. Immediate actions should be undertaken in the first year of implementation. Short-term actions should be undertaken in 1 to 3 years and mid-term actions in 3 to 5 years.


Table ES-2. Energy Strategies and Actions Proposed for West Virginia

 ADVANCED ENERGY STRATEGY ONE		Bring key stakeholders together to guide advanced energy sector development		
ACTION	PRIORITY	TIME FRAME	LEAD ORGANIZATION	RESOURCES
Action E1.1: Form platform steering committee comprising representatives from industry, government, and R&D institutions	Critical	Immediate	TechConnect WV to form committee	Included in TechConnectWV budget Alternatively, \$35,000 per year for part-time support
Action E1.2: Develop opportunities and high-value technology areas with alignment to existing energy-related statewide strategic plans	High	Short-Term	Advanced Energy Platform Steering Committee	\$50,000 in consulting support and analytical services
Action E1.3: Develop key stake-holder groups or subcommittees that are chartered with developing and implementing plans, projects, or activities focused on specific high-priority theme areas (e.g., clean coal technology, carbon sequestration, combustion technology, etc.)	High	Short- to Mid-Term	Advanced Energy Platform Steering Committee	Variable depending on the needs of individual subcommittees

 ADVANCED ENERGY STRATEGY TWO		Establish West Virginia as a leader in advanced energy		
ACTION	PRIORITY	TIME FRAME	LEAD ORGANIZATION	RESOURCES
Action E2.1: Build an active and strong portfolio of advanced research projects funded by the federal government under its advanced energy program initiatives	High	Short-Term	Advanced Energy Platform Steering Committee, WVDO, WV Division of Energy, and Congressional Delegation	Research and public policy support service may be conducted by Advanced Energy Platform Committee members and related institutions
Action E2.2: Establish a significant level of nationally known technology programs funded by industry and venture capital firms	High	Mid- to Long-Term	Advanced Energy Platform Steering Committee	Included in TechConnectWV budget (and related organizations' budgets for support activities)
Action E2.3: Develop capability to write position papers on economic and / or policy issues related to energy across the spectrum of state government, universities, non-profits, and industry sectors	High	Short-Term	Advanced Energy Platform Steering Committee and WVU Energy Policy Leaders	Research and public policy support service may be conducted by Advanced Energy Platform Committee members and related institutions (especially WVU)

Continued on next page

Action E2.4: Take a leadership role in promoting interstate programs for energy research, demonstration, or deployment of advanced technologies				
Action E2.5: Implement advanced energy initiatives throughout governmental, government-related, industrial, and private sector sites to promote energy conservation and efficiency or deploy more environmentally friendly technologies	High	Mid-Term	Advanced Energy Platform Steering Committee, WVDO, WV Division of Energy	Could be significant, requiring state policy supports and financial incentives, but with value established, could far outweigh expenditures
Action E2.6: Increase West Virginia's non-fossil fuel and energy portfolio	High	Mid-Term	Platform Steering Committee, WVDO, WV Division of Energy	Initial support may be provided by Advanced Energy Platform Committee members and related organizations

 ADVANCED ENERGY STRATEGY THREE	Facilitate university, national lab, and nonprofit engagement with industry for technology development and commercialization				
	ACTION	PRIORITY	TIME FRAME	LEAD ORGANIZATION	RESOURCES
	Action E3.1: Hold a series of forums/events in which energy-sector industry representatives outline their needs to the university, national lab, and nonprofit research leaders	High	Short-Term	Advanced Energy Platform Steering Committee	\$10,000
	Action E3.2: Seek establishment of a nationally recognized (such as NSF) industry-university collaborative center in advanced energy technologies to be located at WVU and to focus on commercialization	High	Short- to Mid-Term	Advanced Energy Platform Steering Committee and WVU (possibly National Research Center for Coal and Energy)	Volunteer time plus a potential planning grant
Action E3.3: Encourage commercialization of intellectual property from the National Energy Technology Laboratory	Medium	Mid-Term	WVHEPC and WVDO (with support from Advanced Energy Platform Steering Committee)	\$250,000 annually (for related University-Industry Matching Grant Program)	

Strategies and Actions for the Biometrics Platform



Three strategies and eight actions are proposed to grow West Virginia's Identification, Security, and Sensing Technology (Biometrics) economy. The strategies are briefly described below.



BIOMETRICS STRATEGY ONE

Bring key stakeholders together to guide biometrics sector development

West Virginia contains multiple companies, R&D organizations, and major technology-user organizations engaged in various aspects of biometrics research, consulting, and services. The West Virginia Biometrics Initiative has a good start on bringing organizations and key leaders together and driving this sector in north-central West Virginia. However, the Initiative to date has restricted staffing and curbed activities because of limited financial resources. These organizations must increase their collaboration and joint activities to drive West Virginia's biometrics economy well into the 21st century.



BIOMETRICS STRATEGY TWO

Build a stronger commercial biometrics base

West Virginia has already developed a small but significant base of commercial biometrics support companies — firms providing integration, support services, and software development. Although this represents an important initial step, the state would benefit significantly if it could produce identification, security, and sensing hardware, software, intellectual property, or other products for export.




BIOMETRICS STRATEGY THREE


Aggressively promote WV as the international hub for biometrics, identity, security and sensing technologies


Because biometrics is an emerging industry without a current dominant hub globally, there is a small but significant window of **opportunity for West Virginia to aggressively position itself as a leading location for this important sector.**

The strategies and actions are summarized in Table ES-3. Actions marked critical have the greatest priority, although some may take several years to accomplish. Immediate actions should be undertaken in the first year of implementation. Short-term actions should be undertaken in 1 to 3 years and mid-term actions in 3 to 5 years.

Table ES-3. Biometrics Strategies and Actions Proposed for West Virginia

 BIOMETRICS STRATEGY ONE		Bring key stakeholders together to guide biometrics sector development			
ACTION	PRIORITY	TIMING	LEAD ORGANIZATION	RESOURCES	
Action B1.1: Fund the WV Biometrics Initiative to form the platform steering committee comprising representatives from industry, government, nonprofit, and R&D institutions	Critical	Immediate	WV Biometrics Initiative and WVDO	\$250,000 annually (see Action 8 in General Strategies)	
Action B1.2: Continue to identify and promote opportunities and high-value projects with alignment to existing capabilities in identification, security, and sensing technology areas	High	Immediate	WV Biometrics Initiative	WV Biometrics Initiative and key stakeholders	
Action B1.3: Continue to develop and implement plans, projects, or activities focused on high-priority theme areas	High	Short- to Mid-Term	WV Biometrics Initiative	WV Biometrics Initiative and key stakeholders	

 BIOMETRICS STRATEGY TWO		Build a stronger commercial biometrics base			
ACTION	PRIORITY	TIMING	LEAD ORGANIZATION	RESOURCES	
Action B2.1: Integrate biometric applications and technologies within state-controlled facilities to spur development of WV biometrics companies and industry	High	Mid-Term	WV Biometrics Initiative, WVDO	Could be significant, requiring state policy supports and financial incentives; but, with value established, could far outweigh expenditures	
Action B2.2: Encourage intellectual property development and technology transfer at WV universities and invest in technology commercialization of biometrics products from WV R&D institutions	High	Immediate	WV Biometrics Initiative Plus lead organizations noted in related actions in General Strategy section	WV Biometrics Initiative and key stakeholders (plus resources from related actions in General Strategy section) <i>This is not an independent action but instead links to several general recommendations under Strategies One and Two</i>	
Action B2.3: Provide funds to small WV biometrics companies to support joint R&D projects with area universities and user organizations specific to commercial product development	High	Short- to Mid-Term	WV Biometrics Initiative Plus lead organizations noted in related actions in General Strategy section	WV Biometrics Initiative and key stakeholders (plus resources from related actions in General Strategy section) <i>This is not an independent action but instead links to several general recommendations under Strategies One and Two</i>	
Action 2.4: Recruit a product-based company in the biometrics space	High	Mid-Term	WV Dept of of Commerce, WVDO, WV Biometrics Initiative	Significant — will likely require location incentives from the State of West Virginia and local government	

 BIOMETRICS STRATEGY THREE		Aggressively promote WV as the international hub for biometrics, identity, security and sensing technologies			
ACTION	PRIORITY	TIMING	LEAD ORGANIZATION	RESOURCES	
Action B3.1: Provide funding through the WV Department of Commerce to support and expand the WV Biometrics Initiative's sector-promotion activities	High	Immediate	WVDO and WV Biometrics Initiative	\$250,000+	

Measures of Success

The ultimate measures of success — or outcomes — of the recommended strategies and actions will not come from one particular strategy or action. Instead, they will work together to produce the overall results — an overall boost inTBED in West Virginia. The following list includes specific measures of success for the overall Blueprint:

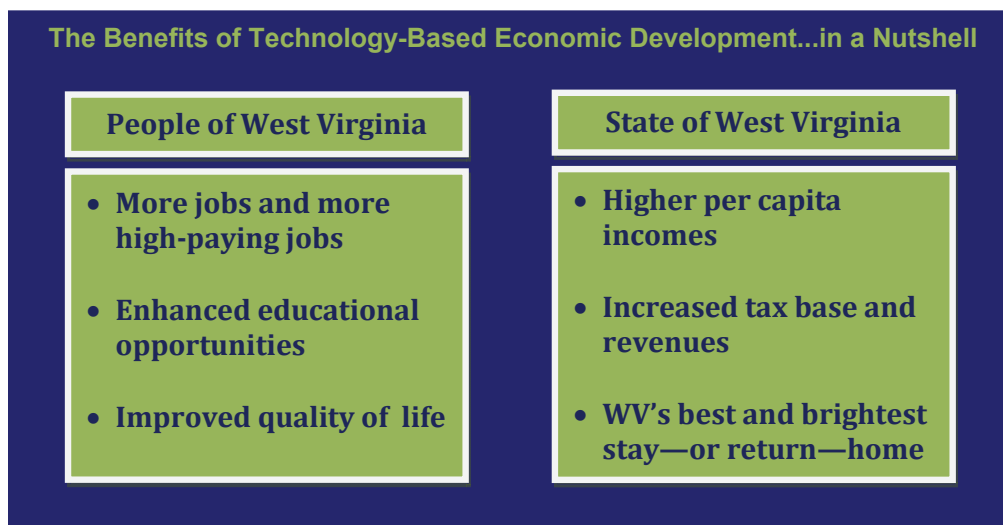
- Continue to **grow the West Virginia academic R&D base** at a pace that significantly exceeds that of the nation, with a target of \$360 million by 2015
- **Increase R&D funding in platform areas** in all sectors (academia, nonprofits, and industry)
- **Increase industry-supported R&D** at West Virginia's universities and colleges to match the national average by 2020
- **Increase the number of technology-based companies** in West Virginia at a rate higher than the national average
- **Increase employment** in private-sector, technology-based companies in West Virginia to reach the national average by 2020
- **Increase the number of spin-off companies** developed from technology created at West Virginia's universities to achieve the national average by 2020

Conclusion

The State of West Virginia — including governmental agencies, economic development groups, universities, nonprofit organizations, and business and industry — **must act boldly and quickly** to grow its research, technology transfer, and commercialization activities.

Innovation and technology lead not only to **more jobs** but also to **higher-paying jobs**, fueling economic growth and increasing the standard of living across entire states and regions where TBED is prevalent (Figure ES-5).

Figure ES-5. Benefits of Technology-Based Economic Development for People and State of West Virginia



Although TBED is not widespread in West Virginia compared with other states and West Virginia is behind its neighbors, peers, and most of the nation in building a technology economy, **West Virginia does have significant strengths** with strong foundations in several technologies, including the following:

- Advanced Energy and Energy-Related Technology
- Advanced Materials and Chemicals
- Identification, Security, and Sensing Technology (Biometrics)
- Molecular Diagnostics, Therapeutics, and Targeted Delivery Systems (Biotechnology).

The **recommended strategies and actions** in this Blueprint will boost West Virginia's knowledge-based economy and thus **propel West Virginia's overall economy well into the 21st century — if successfully implemented**. These strategies and actions are indeed recommendations that can be used exactly as proposed or as guidelines for further refinement and development.

Successful implementation of the Blueprint will require the following:

- **Significant investments** in West Virginia's technology infrastructure
- **Strong leadership** from the recommended lead organizations — and other groups and individuals within the state
- **Long-term commitment** from all stakeholders, including West Virginia's citizens
- **Strong resolve** to make critical and sometimes difficult decisions
- **Genuine will to compete.**

No single organization will be able to carry out this Blueprint or boost West Virginia's innovation economy alone. But, with the right investments, a genuine long-term outlook, and true collaboration among all stakeholders in the state's public and private sectors, **West Virginia can and will become a leader in this vital economic sector.**

Importantly, **if the state succeeds in building its technology-based economy...**

...West Virginia will succeed in fueling its economic growth well into the future, providing current and future generations with abundant vocational, professional, and educational opportunities — and providing high-quality, high-paying jobs well into the 21st century.

This report and all other related report —as well as other information about West Virginia's technology economy—can be found at:

www.TechConnectWV.com



*This report is the **EXECUTIVE SUMMARY** only.*

The full reports can be found at:

www.TechConnectWV.com

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