

2019 FINAL REPORT



TECHCONNECT
WEST VIRGINIA

NextUp
West Virginia

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Thank You

TechConnectWV expresses its sincere appreciation to the U.S. Economic Development Administration, Philadelphia Regional Office, and The Claude Worthington Benedum Foundation for their support of NextUp West Virginia. Their support for this project made it possible to create and retain additional jobs in the state and to prepare more entrepreneurs and early-stage companies to attract the investment funding they need to grow their businesses in West Virginia.

Table of Contents

- 4** Executive Summary
- 6** Delivering on the Bottom-Line Objectives
- 12** NextUp West Virginia Technical Assistance
 - NextUp Sub-Awardee: Center for Applied Research and Technology Inc.
 - NextUp Sub-Awardee: Chemical Alliance Zone
 - NextUp Sub-Awardee: INNOVA Commercialization Group
- 24** NextUp West Virginia Success Stories
- 28** TechConnectWV Executive Committee, Officers & Board of Directors
- 29** NextUp West Virginia Sub-Awardees
- 30** TechConnect WV Business Incubators & Accelerators in West Virginia
- 34** NextUp West Virginia Media Coverage

WV Coalition for Technology-Based Economic Development, Inc.
dba TechConnect West Virginia
Final Report
EDA Grant 01-79-14774
Submitted to the
U.S. Economic Development Administration
December 30, 2019

Executive Summary

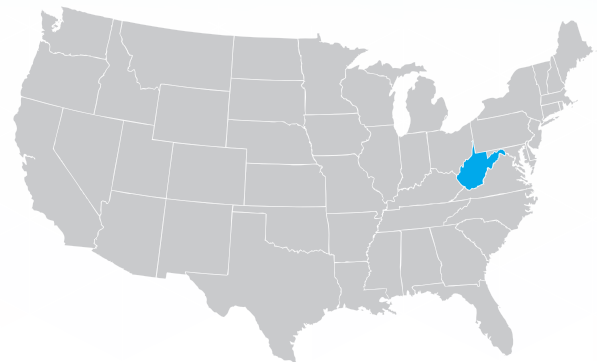
In 2017, through the support of the U.S. Economic Development Administration and The Claude Worthington Benedum Foundation, TechConnect West Virginia launched a project called NextUp West Virginia. The project was designed to help take entrepreneurs, early-stage companies and newly reoriented existing firms forward in their development by offering them access to:

- Enhanced, next-stage commercialization assistance;
- Sophisticated training to improve their ability to successfully pitch to investors; and
- A strengthened and engaged regional investor network.

TechConnect also designed its *NextUp West Virginia* project to better integrate and inter-connect the state's incubators and accelerators with the goal of helping them to offer opportunities to a wider range of entrepreneurs and small businesses and to strengthen and leverage the overall innovation and entrepreneurial network.

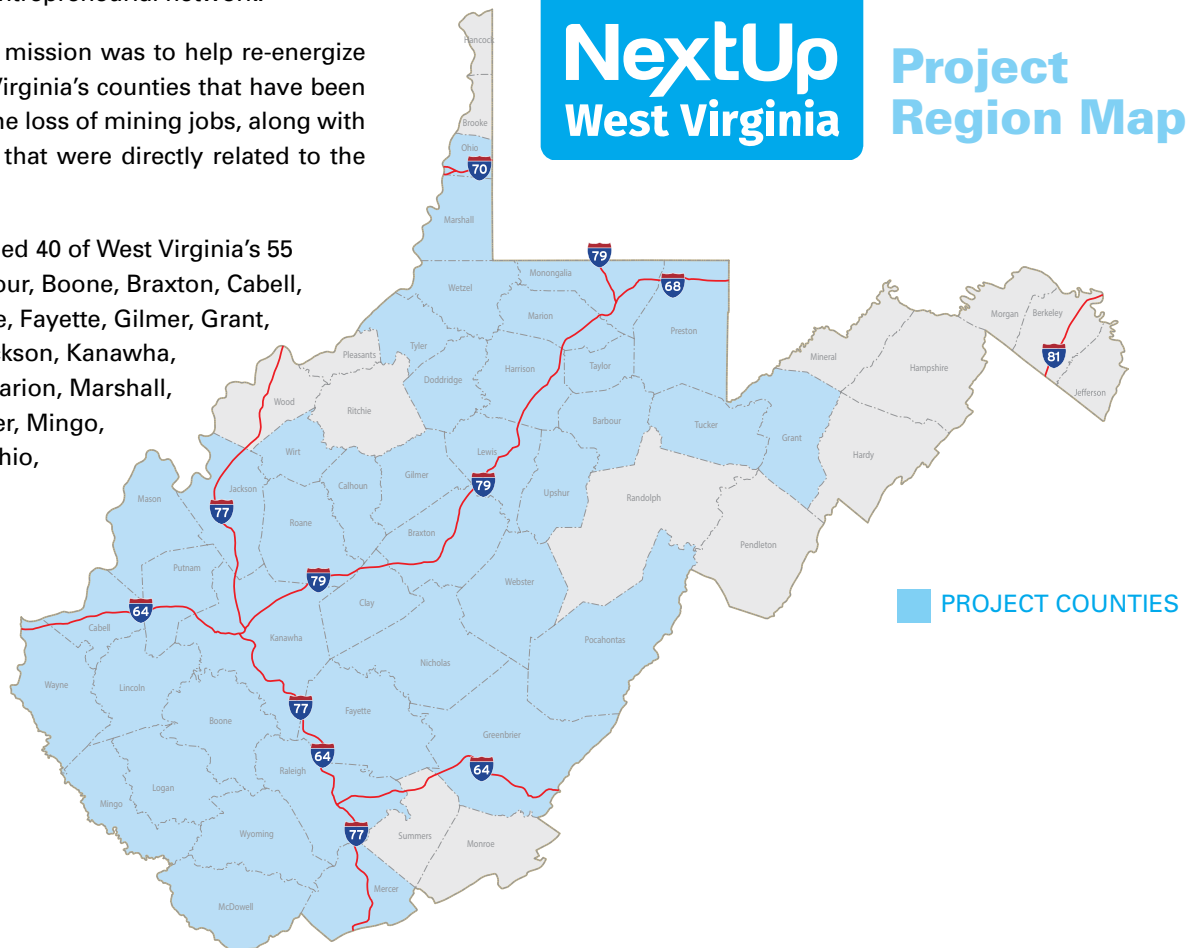
The project's underlying mission was to help re-energize the economies in West Virginia's counties that have been particularly affected by the loss of mining jobs, along with thousands of other jobs that were directly related to the mining industry.

The project region included 40 of West Virginia's 55 counties, including Barbour, Boone, Braxton, Cabell, Calhoun, Clay, Doddridge, Fayette, Gilmer, Grant, Greenbrier, Harrison, Jackson, Kanawha, Lewis, Lincoln, Logan, Marion, Marshall, Mason, McDowell, Mercer, Mingo, Monongalia, Nicholas, Ohio, Pocahontas, Preston, Putnam, Raleigh, Roane, Taylor, Tyler, Tucker, Upshur, Wayne, Webster, Wetzel, Wirt and Wyoming.



**NextUp
West Virginia**

**Project
Region Map**



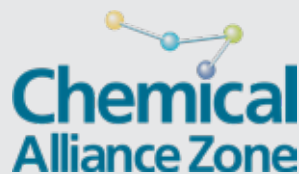
These 40 counties represent a wide range of economic conditions, with a few showing growth, but the majority struggling in the wake of declining energy markets, the sudden loss of 10,000 coal mining jobs in the last five years, and the subsequent loss of jobs in other sectors, including service industries, boards of education, municipalities and county governments. Many are suffering from long-term economic downturns and require assistance in building bottom-up strategies that build on regional assets to create growth and resiliency. Included in this region are the southern coalfields of West Virginia, the Kanawha Valley with its long history of petrochemical manufacturing, much of the Ohio River valley, all of central West Virginia, most of southeastern West Virginia, the north central part of the state and a portion of the state's northern panhandle. Major population areas in the region include both of the state's major university towns, Morgantown and Huntington, and the state capital, Charleston. Importantly, these areas also contain many of the regions key assets and thus are critical for spurring investment, innovation, and job creation not only in those areas, but also across the entire region.

The economic situation in West Virginia was worsened by widespread and destructive flash floods that hit the area in June 2016, devastating many areas. According to the National Weather Service, parts of Fayette, Nicholas, and Greenbrier counties suffered a 1,000-year event with two-day rain accumulations approaching 10 inches. Other counties hit by the flood included Clay, Kanawha, Pocahontas, Monroe, Summers, Webster, Jackson, Roane, and Ohio. Bridges, schools, homes, nursing homes, and businesses were destroyed, and then-West Virginia Governor Earl Ray Tomblin declared a state of emergency for 44 of the state's 55 counties. It was a Presidentially declared disaster; FEMA DR 4273.

From its creation as a state in 1863, West Virginia's economy has depended on natural resources, including coal, oil and gas, and timber. Downturns in the energy sector—in both coal and natural gas—have negatively affected the entire region, with the resulting loss of jobs in other sectors and services that support the energy sector. Economic drivers vary within each sector of the region. According to the ARC-posted County-Level Coal Mine Employment and Coal Production Data from the U.S. Mine Safety and Health Administration, 2000-2015, total employment in the coal sector in 2012 was 23,019, but this number had dropped 30.2 percent to 16,062 by 2015, for a total loss of 6,957 jobs. In just the last year of available data, jobs went from 19,189 in 2014 to 16,062 in 2015 for a total loss of 3,127 jobs (16.3 percent). The Energy Information Administration reported a similar loss of 2,840 coal jobs in West Virginia between 2014 and 2015, a 15.5 percent decline (<https://www.eia.gov/coal/annual/>).

To deliver the technical services required to deliver on Grant 01-79-14774, TechConnectWV selected three sub-awardees – Center for Applied Research and Technology, Inc. (CART), Chemical Alliance Zone (CAZ) and INNOVA Commercialization Group – that have proven track records of helping to position entrepreneurs, early-stage companies and forward-thinking established businesses for success.

NextUp West Virginia Sub-Awardees



In addition to those sub-awardees, TechConnectWV also engaged Angel Capital Group (ACG) a Nashville, Tennessee-based syndicate of angel funds across the Appalachian region to identify opportunities for angel investment in West Virginia early-stage and existing companies.

The following final report details how the U.S. EDA's and The Claude Worthington Benedum Foundation's investment in Grant 01-79-14774 enabled measurable results with respect to spurring more entrepreneurial activity in the state, helping entrepreneurs and early-stage companies attract investments, and creating and retaining jobs for West Virginians.

Without U.S. EDA's and The Claude Worthington Benedum Foundation's support, these results and the positive effects on our state's economy would not have been possible.

Delivering on the Bottom-Line Objectives:

Help Launch More Entrepreneurs. Create and Retain More Jobs.

To deliver on its mission to help re-energize the economies in West Virginia's counties that have been particularly affected by the loss of mining and mining-dependent jobs, TechConnectWV and its sub-awardees set straightforward objectives for *NextUp West Virginia*.

- Help create at least 22 new jobs.
- Help retain at least 50 jobs.
- Help create at least 15 new companies
- Help entrepreneurs and early-stage companies attract at least \$1 million in private capital.

TechConnectWV is pleased to report that *NextUp West Virginia* exceeded each of those objectives.

- **Jobs Created: 46**
- **Jobs Retained: 82**
- **New Companies Created: 19**
- **Private Capital Investments: \$2,226,000**

Those results were achieved by the project's three sub-awardees assisting 77 entrepreneurs, and early-stage and existing companies, and Angel Capital Group evaluating and coaching 27 early-stage companies.

It is worth noting that U.S. EDA's investment in *NextUp West Virginia* coupled with its investment in TechConnectWV's predecessor project, *ScaleUp West Virginia*, enabled:

- Assistance to 121 entrepreneurs, start-up and existing companies
- 105 new jobs to be created
- 169 jobs to be retained
- 49 new companies to be created
- More than \$7.2 million in investment capital for entrepreneurs and early-stage companies

NextUp West Virginia's Task List and Performance

To help re-energize the economies in the counties most affected by the significant loss of jobs related to the mining industry, TechConnectWV developed the following task list to help spur more entrepreneurial activity, position more entrepreneurs for success with angel investors, and strengthen the entrepreneurial support system:

1. Develop and launch, through TechConnectWV's sub-awardees, TechAssistWV to advance enhanced commercialization opportunities in chemicals and advanced materials, technology and advanced manufacturing by providing next-level technical, entrepreneurial, and commercialization assistance to start-ups and small businesses across the region.

2. Develop and launch West Virginia Innovation Network (WIN) to integrate and inter-connect and the state's incubators and accelerators, thereby creating networked Centers of Innovation and Entrepreneurship that can better collaborate and partner to create jobs and investments across the region. This program will identify mutual goals and missions, develop shared initiatives, and host workshops where applicable.

3. CapLink WV will create more capital investment opportunities in the region by focusing on both sides of the capital conundrum – improving the readiness of entrepreneurs, start-ups, and small business to attract capital and improve connections between the groups and potential capital providers. This will include providing "Investor Readiness" webinars and workshops, pitch competitions, linking regional angel investor groups to expand opportunities and supporting exhibit readiness to compete and meet with potential venture providers.

TechAssistWV's Performance

Through TechAssist, specifically CAZ and its ChemAssist program, *NextUp West Virginia* targeted, next-stage commercialization assistance to 30 entrepreneurs, start-ups, and small businesses in the chemicals and advanced materials sector and related sectors, including energy, manufacturing, and biotechnology. The assistance included:

- Expert Technology and Commercialization Consultation and Guidance
- Economic Analyses, Estimations or Assistance
- Intellectual Property (IP) Evaluations and Assistance
- Proof-of-Concept and Scale-Up Assistance

Through CART and its RapidAssist program, *NextUp West Virginia* provided next-stage product development guidance to 10 entrepreneurs, start-ups, and small businesses who had developed a prototype and were ready to prepare to seek capital, identify export potential, and explore new markets. CART's range of services and consultation included:

- Design and Utility Patenting Support
- Engineering Economic Analysis
- Digital Manufacturing Source Code Development
- Printed Circuit Board Design and Development
- Investor Readiness Support
- Late-phase Prototype Enhancement
- Initial Product Production
- Marketing Support

Through INNOVA and its VentureAssist program, *NextUp West Virginia* assisted 37 entrepreneurs, start-ups, and small businesses and manufacturers in various technology sectors by providing higher level business and start-up guidance, as well as seed and early-stage capital assistance. That assistance included:

- Pitch training for investor readiness
- Business support and technical services
- Entrepreneurial guidance and referrals
- Legal, accounting and various professional assistance
- Marketing assistance
- Seed and early-stage capital assistance and guidance

West Virginia Innovation Network's (WIN) Performance

NextUp West Virginia developed the West Virginia Innovation Network, or "WIN," to integrate and inter-connect the state's incubators and accelerators, thereby creating networked Centers of Innovation and Entrepreneurship that can better collaborate and partner to create jobs and investments across the region. Specifically, *NextUp West Virginia* worked to bring the appropriate incubators and accelerators together to:

- Identify mutual goals and missions
- Share resources, expertise, best practices and learnings
- Develop shared activities, programs and initiatives

To accomplish that, TechConnectWV committed to using a variety of forums – such as workshops, in-person meetings and conferences, webinars or other electronic platforms – to help the centers overcome common obstacles, create more efficient processes and, ultimately, better assist entrepreneurs, start-ups, and small businesses across the region.

TechConnectWV partnered with Ohio University's LIGHTS program to engage the International Business Innovation Association (InBIA) in providing an intensive "Entrepreneurship Center Management (ECM)" certification program for 14 leaders and representatives from 10 business incubators and accelerators from across the *NextUp West Virginia* project footprint. Fifteen representatives from incubators and accelerators from southeastern Ohio and eastern Kentucky also invested their resources to attend. By offering an intensive version of the certification locally at the Advanced Technology Center on the campus of BridgeValley Community and Technical College in South Charleston, TechConnectWV and LIGHTS made a valuable professional development opportunity much more accessible and affordable. The course covered topics that included:

- *Fostering Your Entrepreneurship Center's Role in Your Community*

This discussion covered how an existing or new center can fit within the greater context of their communities' existing assets; how to conduct client-targeted outreach campaigns; the importance of community relations efforts; and how to set graduation criteria and other critical metrics and performance indicators.



Participants collaborate on a best-practices exercise during TechConnectWV's Entrepreneurship Center Management training. The training was held March 20-21, 2019, in South Charleston.

- *Finance and Operations for Sustainable Entrepreneurship Centers*

This topic covered how to find the right mix of diverse funding sources and business models that promote sustainability; how to develop or refine methods of onboarding and tracking clients and their progress; and how to develop effective staffing and employee retention tactics.

- *Building Profitable Programs that Serve Entrepreneurs*

This section included delivering high-impact programs and services to targeted industries and identifying ways to create effective mentoring networks.

- *Space, Design, Software and Other Ways to Streamline Operations*

This final discussion covered how to design and streamline a center's behind-the-scenes operations, as well as developing a physical location and space that delivers the intended experience and services for clients.

The participating West Virginia and Ohio incubators and represented areas in their states that have been particularly affected by the downturn in coal and its related industries. While that common perspective created a natural networking opportunity, differences among the communities that were represented promoted a productive exchange of unique experiences, ideas and practices. Feedback from the participants reflected the workshop's value to the participating organizations.

"The most beneficial (training) I've had in 2 years..."

"I got a lot of new contacts and a much better understanding of entrepreneurship centers, having been in this realm for only 2.5 months..."

“Lots of great examples, samples policies, ideas for classes...”

“Great opportunity to work with other groups and people...”

“I feel lucky to have attended this training this early in (my) project...”



The NextUp West Virginia project allowed TechConnectWV to bring an Entrepreneurship Center Management certification training for incubators and accelerators to West Virginia. The two-day training laid the foundation for providing better support for entrepreneurs in the state.

The participating incubators and accelerators, along with TechConnectWV, received memberships in InBIA, giving them access to a wealth of best practice, networking and staff development resources. The workshop also effectively laid the foundation for a more cohesive, inter-connected network of business incubators and accelerators that can support West Virginia’s entrepreneurs with more consistent, best practices-based service.

TechConnectWV’s post-training follow-up with the West Virginia participants indicated a strong interest in sharing best practices and strategies for growth. In response, TechConnectWV organized and led monthly conference calls in which leaders from incubators and accelerators across the state shared best practices on how to recruit entrepreneurs, develop sustainability strategies, learn about special events and professional development opportunities and other information of common interest to the group. Each of the calls featured a speaker from a different incubator or accelerator.

As set out in its request for Grant 01-79-14774, one of TechConnectWV’s goals was to integrate and inter-connect the state’s incubators and accelerators, thereby creating networked Centers of Innovation and Entrepreneurship that can better collaborate and partner to create jobs and investments across the region. Based on feedback thus far,

the calls have created a valuable forum for learning and networking that had not existed. TechConnectWV plans to continue the calls and connect the group with regional or national subject matter experts to further expand the centers’ thinking on best practices.

CapLinkWV’s Performance

CapLinkWV was developed to create more capital investment opportunities in the region by focusing on both sides of the capital conundrum – improving the readiness of entrepreneurs, start-ups, and small businesses to attract capital and improving connections between those groups and potential capital providers. To accomplish its purpose, CapLinkWV would:

- Work with individual entrepreneurs, start-ups and small businesses to better focus and define their funding pitches and to improve their pitch presentations and overall investor readiness
- Provide – or connect to existing – “Investor Readiness” webinars and workshops, pitch competitions, and other venues, potentially with assistance from regional groups like Innovation Works and regional competitions like TransTech at West Virginia University
- Link regional angel investor groups and other capital providers to the region’s entrepreneurs, start-ups and small businesses, both one-to-one and in conferences, pitch competitions, and other venues
- Link West Virginia’s investor community with regional angel investor groups to expand the number of pitch opportunities for West Virginia firms and entrepreneurs and to expand the potential sources of venture funds
- Support entrepreneurs who exhibit readiness to compete in regional pitch competitions and to meet with potential venture providers

Through its engagement with Angel Capital Group, **27 early-stage companies were evaluated and coached regarding their preparedness for the angel investment market. By NextUp West Virginia’s closing, four companies had pitched to local and out-of-state investors, with one company receiving investment from Angel Capital Group’s syndicate of microventure funds and the Appalachian Investors Alliance (AIA). The three other companies remain under strong consideration for funding. Two other companies received investments through the West Virginia Jobs Investment Trust.**



Attendees learn from Scott Ewing of Angel Capital Group about how investors select – and de-select – investment opportunities at TechConnectWV’s “Pitching Angel Investors: What to Expect and How to Prepare” workshop in Fairmont on June 6, 2018.

Two “Investor Readiness” workshops were held in 2018 to help educate entrepreneurs, leaders of early-stage companies, and service providers that support entrepreneurship activities in West Virginia on how to prepare for pitching investors.

The first workshop was held June 6, 2018, at the Robert H. Mollohan Research Center in Fairmont. Thirty entrepreneurs and representatives of several service providers that support them attended the half-day event. The curriculum for the workshop was created and delivered by Eric Dobson, CEO, and Scott Ewing, COO, of ACG.

The workshop gave attendees a unique opportunity to hear directly from the angel investor community about how investors select – and, more importantly, de-select – their investments. Specifically, ACG’s discussion included topics such as:

- Trends in the investing space
- The difference between purely monetary business endeavors vs. social impact-oriented businesses
- Insight to the mind of the typical investor
- Heuristics that investors use to weed out deals
- How to develop a succinct set of materials that speak for themselves
- How to identify and highlight the “wow factor”
- How investors evaluate pitches
- The steps that an entrepreneur, start-up or small business should go through as a part of their due diligence process prior to approaching an angel investor

The same curriculum was delivered on September 19, 2018, at Bridge Valley Community and Technical College’s Advanced Technology Center at the West Virginia Regional Technology Park in South Charleston. Forty entrepreneurs, early-stage companies and service providers attended that workshop.

Feedback on ACG’s curriculum at the events and to TechConnectWV’s post-workshop survey were overwhelmingly positive...

“The valuation equations and slides have already helped my fine tune my pitch.”

“The ‘What to Expect’ topics presented and their related in-person, follow-up questions and discussion were most informative.”

“I thought it covered the basics of pitching really well.”

“The ability to discuss specifics face to face with someone typically on the other side of the table (was most valuable).”

Afternoon sessions were held at both the Fairmont and South Charleston workshops for smaller groups of participants. A total of 11 entrepreneurs and start-ups were invited to make “practice pitches” for angel funding in those sessions. The participants were recommended by TechConnectWV’s *NextUp West Virginia* sub-awardees. TechConnectWV also engaged other stakeholders for recommendations, including West Virginia Jobs Investment Trust and Robert C. Byrd Institute for Advanced Flexible Manufacturing.

ACG conducted baseline due diligence on the candidates prior to the workshops. The objective was to invite entrepreneurs and start-ups that were far enough along in their development that they could prepare a practice pitch and benefit from feedback and questions from ACG and from their own entrepreneurial peers. The objective was not to put an unprepared entrepreneur in an uncomfortable environment and potentially discourage them from continuing their development. Based on feedback from the participants, the afternoon sessions were extremely valuable in their businesses’ development.

ACG provided TechConnectWV additional feedback and recommendations on what each participant might consider in order to become more prepared for the angel investor market. In one start-up’s case, that feedback included validation of its viability as a business but recommended that it might be a better fit for corporate sponsorship or grants rather than angel investment as sources of capital, thereby providing recommendations for a more efficient

and appropriate path to funding. That feedback was shared with the service provider that worked with the start-up for its consultation with the owners. ACG also provided feedback and recommendations to the other service providers on their entrepreneurs and start-ups.

At the conclusion of *NextUp West Virginia*, ACG provided TechConnectWV with valuable insight on West Virginia's current entrepreneurial landscape and recommendations on what the state's collective entrepreneurial support system might consider as it works to assist entrepreneurs and early-stage companies.

First, from ACG's perspective, there is a healthy amount of technology under development in the state that has commercial value. Second, there is a great deal of resident engineering talent for developing intellectual property around which to form businesses with the potential for high growth, community impact, and the creation of durable wealth in the state.

Third, most of the businesses, entrepreneurs and early-stage companies encountered do not necessarily fall into the category of "moon-shot" companies in terms of value. Those companies tend to be overlooked by angel investors because they do not fit the traditional venture model. However, ACG points out that there are new deal structures in private equity financing, such as revenue share/royalty deal structures, that allow private equity investors to achieve acceptable returns while building community capacity and creating jobs in the region.

Fourth – and of particular significance – with the exception of a few funds -- is the absence of a well-developed, grass-roots angel investor community in West Virginia. Further, with the exception of a few funds, venture capital is scarce within the state. As ACG noted, investors are the catalyst for change in any entrepreneurial ecosystem. Even though West Virginia does not have a history of technology-based, angel- and venture-style investing, the state does have examples of successes to build on. Those examples can provide a solid foundation for new entrepreneurial and investment activity in West Virginia.

As ACG said in its report to TechConnectWV, "Technology and talent are widely distributed. Capital is not. When companies form, if they can't find capital locally, they fail or move to be near capital sources. Private equity investing is not taught in business schools. So, when angel investors attempt to enter this process without the proper support, they typically fail. When an angel investor fails, he/she will often quit altogether, and will express to their associates such horror stories. Only the resilient investors survive this process, which explains why less than 5% of the 5 - 8 million accredited investors in the US participate in the industry. However, when

an angel investor succeeds, he/she will typically invite their friends, colleagues, and peers into the process."

The educational and actual pitch opportunities enabled by U.S. EDA's and The Claude Worthington Benedum Foundation's support for *NextUp West Virginia* will play an important role in attracting new investors to the state.

Beyond helping participants better understand and prepare for pitching for angel investor funding, the workshops laid the foundation for creating a new community of entrepreneurs and start-ups. In particular, TechConnectWV noted the networking that occurred in the two workshops, especially during the two afternoon sessions.

Seeking to leverage that networking and the peer-to-peer exchanges that occurred to create a more active, entrepreneur-driven community that fosters more entrepreneurial activity in West Virginia, Anne Barth, TechConnectWV's executive director, and John Golden, *NextUp West Virginia* project manager, met with local business leaders who share TechConnectWV's vision for more entrepreneurial activity in the state. The result of those discussions was an inaugural meetup-type gathering for Charleston-area entrepreneurs. The meetup was held on September 25, 2019, in downtown Charleston at Black Sheep Burrito. Sixteen entrepreneurs, local business leaders, and representatives from Senator Shelley Moore Capito's office, the West Virginia Secretary of State's office and the City of Charleston Mayor's Office of Economic Development attended. The goal for 2020 is to meet on a monthly basis to network with peers, service providers and others who can support them in their development and to hear from subject matter experts on topics of interest to early-stage businesses.



Max Knapp, Portfolio Manager with United Bank Wealth Management, welcomes Charleston-area entrepreneurs, and business and government leaders to the inaugural Entrepreneur Meetup at Black Sheep Burrito in downtown Charleston on September 25, 2019.

NextUp West Virginia's Technical Assistance

TechConnectWV's *NextUp West Virginia* sub-awardees supported entrepreneurs and early-stage and existing companies through a broad range of technical assistance that ranged from market validation and business planning to prototype design and development. Following is a list of entrepreneurs and early-stage and existing companies that directly benefitted from technical assistance made possible through U.S. EDA's and The Claude Worthington Benedum Foundation's investment in *NextUp West Virginia*.

The sub-awardees also responded to requests the West Virginia Development Office, local economic development organizations, Mid-Atlantic Research Technology & Innovation Center (MATRIC), West Virginia Regional Technology Park and other stakeholders across West Virginia's development ecosystem. The sub-awardees shared their expertise with those groups on a range of needs, including product and market validation for a wide range of entrepreneurs and early-stage companies.



Center for Applied Research and Technology (CART)



GLOGames, LLC Philippi, Barbour County

GLOGames, LLC has developed electric-, battery-, and solar-power LED lighting systems designed to attach to outdoor basketball rims and overcome the absence of an expensive outdoor lighting system. CART's assistance included designing and constructing a prototype of a clam-shell thermoplastic packaging mold.



ScorpWorks, LLC Bluefield, Mercer County

ScorpWorks, LLC is an early-stage company that designs and produces rugged multi-passenger all-terrain vehicles. CART's services included developing engineering plans and fabrication solutions, preparing Linux-CNC digital manufacturing source code, and conducting specific applied research.



X-MAT Bluefield, Mercer County

X-MAT has developed a proprietary chemical and coal powder to create X-TILESM Coal Core Composite Roof Shingles. The shingles are eco-friendly, stronger and lighter than current ceramic tiles, fireproof, and less expensive as they use significantly less energy to produce than current ceramic tiles. CART's assistance included designing and testing an injection mold for the company's roof tile product.

GreySurf, LLC Bluefield, Mercer County

GreySurf, LLC is a start-up that is developing a cyber security training platform. CART's assistance included business planning and identifying and refining its technology solutions.



KDE Technology

Hurricane, Putnam County

KDE Technology is creating software that will streamline mobile application development. CART supported the company in researching and identifying the best technology tools and developing a beta version of the product.



RoadSpan Systems

Huntington, Cabell County

RoadSpan Systems is start-up that is developing a wireless signaling system to alert drivers about oncoming school buses that are not visible due to hills and curves. CART assisted RoadSpan in refining its circuit board design and business planning.

Tekkers Safety Goals

Charleston, Kanawha County

Tekkers Safety Goals is a start-up that is developing a soccer goal that is, by design, less susceptible to tipping and is not dependent upon players, coaches, or league/property officials being diligent in anchoring the goal to achieve a safer play environment. CART provided design services and guidance on materials selection.

Helios Energy WV, LLC

Bluefield, Mercer County

Helios Energy WV, LLC is developing clean energy services and solutions around energy auditing services, solar energy solutions, LED lighting solutions, and energy management systems. As a part of its work with them, CART helped the company refine its design calculations for a significant energy-efficient lighting replacement project.



Commit

Charleston, Kanawha County

Commit is a start-up that is developing a small, pocket-sized lockbox in which a person can place their automobile key and lock it with a timer as a voluntary tool for preventing drunk driving. CART provided design and utility patenting support, digital manufacturing source code development and other technical services.



Kustom Doors, LLC

Beaver, Raleigh County

Kustom Doors, LLC is an early-stage company that is developing a unique interior door for the residential home building and remodeling market. The company's Kaydoor product is designed to look like any other high-quality six-panel interior door. However, the panels are actually hinged doors that cover built-in compartments for storing jewelry and other valuables. CART helped Kustom Doors develop a radio frequency identification (RFID) locking mechanism to provide a secure home storage solution.

Keen Process Technologies

South Charleston, Kanawha County

Keen Process Technologies has developed several new chemical technologies, including shale gas to high octane fuels. CAZ helped the company prepare its information for pitching to investors and then facilitated meetings with potential investors.



Burly Boy

Dunbar, Kanawha County

Burly Boy is a start-up company that manufactures beard, skin and facial care products for men. CAZ provided the company guidance on marketing, general business development and operations.



Preiser Scientific

South Charleston, Kanawha County

Preiser Scientific is a small business that provides chemical and laboratory supplies and equipment to industry and academia. CAZ facilitated the company's introduction to potential customers in the state's higher education sector.



Cyclops Industries

South Charleston, Kanawha County

Cyclops Industries designs and manufactures safety sight glasses, viewpoint assemblies, sight flow indicators, spray rings, sight lights and sight glass replacements for observing processes in industrial pressure vessels and pipelines. CAZ supported Cyclops Industries in developing apprenticeship opportunities for new and potential employees.



EnviroCalc

South Charleston, Kanawha County

EnviroCalc provides specialized environmental consulting services to the chemical, oil, gas and other industries. The company specializes in areas such as evaluating chemical spills, estimating chemical emissions, air dispersion, modeling, and exposure, hazard and risk assessment.

SIOX

SIOX

South Charleston, Kanawha County

SIOX is developing a simple, low-cost process for manufacturing high-purity synthetic magnetite. CAZ helped the company by facilitating introductions and opportunities with potential investors.



Greenbrick Systems

Rainelle, Greenbrier County

Greenbrick Systems is developing construction-grade bricks from recycled corrugated cardboard. CAZ provided the company with general business guidance as it engaged with a service provider on its product's design.

Bullock Distillery

Charleston, Kanawha County

Bullock Distillery is establishing a whiskey distillery. The start-up is an integral part of the effort to revitalize a part of Charleston's "Elk City" neighborhood. CAZ supported the company's equipment needs and provided guidance on its production processes and business planning.



Vimasco Corporation

Nitro, Kanawha County

Vimasco Corporation manufactures specialized protective coating, adhesives, reinforcing cloth, and fire-retardant materials for use in various industries. CAZ provided guidance on technologies and commercialization.

Delwood Equipment

Charleston, Kanawha County

Delwood Equipment manufactures valves and other equipment for the chemical industry and others.



PolyPlexx

South Charleston, Kanawha County

PolyPlexx is developing unique polyurethanes that have utility in a variety of commercial applications requiring transparency and improved impact resistance. CAZ provided guidance on technologies and commercialization.



Mountain State Distillery

Charleston, Kanawha County

Mountain State Distillery developed Charleston's first micro-distillery. Located in downtown Charleston, Mountain State Distillery specializes in producing a unique bourbon mash whiskey with corn, wheat and barley. CAZ supported the company by providing guidance on manufacturing processes and commercialization opportunities.



Future Fungi

Lewisburg, Greenbrier County

Future Fungi is developing a 100-percent bio-degradable, mycelium-based material that can be used as "packing peanuts," planting pots and panel material. CAZ helped the company refine its technology approach and provided general commercialization support.

Bionovics

Huntington, Cabell County

Bionovics is developing ginseng-based extracts and ginseng-based products. CAZ provided the company with initial evaluations of opportunities in the state and potential collaborations and partners.



Progenesis

Huntington, Cabell County

Progenesis has developed a process for producing alginate using genetically modified bacteria for medical and other applications. CAZ provided the company with guidance on its chemical and commercialization processes.



X-MAT

Bluefield, Mercer County

X-MAT has developed a proprietary chemical and coal powder to create X-TILES™ Coal Core Composite Roof Shingles. The shingles are eco-friendly, stronger and lighter than current ceramic tiles, fireproof, and less expensive as they use significantly less energy to produce than current ceramic tiles. CAZ supported the company in its technology and commercialization evaluations.



Aither Chemicals

South Charleston, Kanawha County

Aither Chemicals is developing a process to create ethylene-derived, value-added products. CAZ supported the company in its technology and commercialization validation processes.

C Chain Development

Charleston, Kanawha County

C Chain Development is developing plans for a natural gas-to-chemicals plant. CAZ supported the company in its technology and commercialization planning.

Composite Transport Technologies

Charleston, Kanawha County

Composite Transport Technologies is developing light-weight cargo/shipping containers for the airline industry. CAZ supported the company in its technology and commercialization evaluations.



Hemeworks

Charleston, Kanawha County

Hemeworks is a start-up created by University of Charleston students that is developing a blood-sugar monitoring device. CAZ supported the company in developing its technology and commercialization strategies.

Nexus Bridge

South Charleston, Kanawha County

Nexus Bridge is a start-up company that is developing a process to produce biofuels and other biomass products from algae. CAZ supported the company in validating its technology and commercialization opportunities.



SelenBio Chemical

South Charleston, Kanawha County

SelenBio Chemical is developing new surface treatments and coatings, such as paints and epoxy resins, using the company's proprietary SELDOX® antimicrobial technology. CAZ supported the company in validating its technology and commercialization strategies and by facilitating meetings with potential resources and partners.



US Methanol

Institute, Kanawha County

US Methanol is a start-up company that is establishing a methanol manufacturing facility just west of Charleston. CAZ assisted the company in creating a workforce development strategy for chemical operators.

Appalachian Bio-Coal

Fayetteville, Fayette County

Appalachian Bio-Coal is a start-up company that is producing lump charcoal from coal for use in manufacturing metals and other products. CAZ helped the company evaluate its production technologies and processes.



Domestic Synthetic Fuels

Point Pleasant, Mason County

Domestic Synthetic Fuels is a coal-to-liquids start-up that is planning to develop a facility in the state. CAZ helped the company evaluate its manufacturing processes and in facilitating introductory discussions.



Rubberlite

Huntington, Cabell County

Rubberlite is a small manufacturer of foam and other rubber and plastic products. CAZ assisted the company in evaluating expansion opportunities.



CL-WV Holdings

Charleston, Kanawha County

CL-WV Holdings is a start-up that is evaluating commercial technologies for manufacturing carbon products and hydrogen from natural gas. CAZ helped the company evaluate various technologies and facilitated discussions about a potential pilot plant and developing other technologies.



SGA Polymers

South Charleston, Kanawha County

SGA Polymers is developing technologies to produce acrylic acid and acrylate esters from renewable raw materials. CAZ supported the company in developing its technology and commercialization strategies.



Wright Wold Scientific
 Morgantown, Monongalia County

Wright Wold Scientific has developed a new process and tools for inventorying and identifying laboratory animals. The company’s SwifTAG System utilizes near-field communication technology to seamlessly integrate animal tagging and tracking in an efficient and hands-off manner. INNOVA assisted the company in its business planning and preparation for entering the investor market.



Figure 8 Surgical, Inc.
 Morgantown, Monongalia County

Figure 8 Surgical, Inc. has developed the FlatWire Sternal Closure System replace common steel wire in primary sternal closure procedures. INNOVA helped the company prepare to pitch investors.



IstoVisio
 Morgantown, Monongalia County

IstoVisio has created an immersive virtual reality and annotation system called syGlass. The system is designed to work seamlessly with a variety of virtual reality technologies and produce immersive virtual relation renderings. INNOVA helped prepare the company to pitch investors.



Downey Ridge Environmental Company
 Ansted, Fayette County

Downey Ridge Environmental Company developed Greasezilla™, a patented system that removes brown grease from collected fats, oils and grease waste and is powered by the biofuel it produces from those waste materials. INNOVA helped prepare the company to pitch investors.



Aither Chemicals
 South Charleston, Kanawha County

Aither Chemicals, LLC is developing a patent pending integrated process for creating ethylene-derived, value-added chemical products using a single efficient, integrated system. INNOVA worked with the early-stage company to position it for potential investments.



Billow

Charleston, Kanawha County

Billow has designed and is producing the first premium breast support pillow for millions of women who experience discomfort following breast surgery. INNOVA worked with the early-stage company to position it for potential investments.

INNOVA worked with the following entrepreneurs and early-stage companies to validate their market opportunities and develop business plans to move them forward:

Appalachian Botanical

Fayetteville, Fayette County

Appalachian Botanical is developing a commercial-scale lavender production.

Barix Medical

Huntington, Cabell County

Barix Medical is developing an electromagnetic gastric balloon that is swallowed for effective weight loss.

Bel-Gaming

Boomer, Fayette County

Bel-Gaming, LLC is designing a soil amendment involving live algae bacteria.

Boris Data Analytics

Charleston, Kanawha County

Boris Data Analytics is creating a paid-access, on-line database of commercial real estate in West Virginia.

Callsaver Corporation

Clarksburg, Harrison County

Callsaver Corporation is developing a gyro-centrifugal inertia propulsion device powered by electric battery or solar power.

C-Chain Development

Charleston, Kanawha County

C-Chain Development is using existing technology in combination with natural gas to produce oils, waxes and solvents without the contaminants found in crude oil.

Clearwater Technology Consultants

Morgantown, Monongalia County

Clearwater Technology Consultants provides design, engineering and patient-specific 3D printing of anatomical models.

Cross Roads Pharmaceuticals

Huntington, Cabell County

Cross Roads Pharmaceuticals is developing a protein-based pharmaceutical weight-loss therapy.

Ecrue

Huntington, Cabell County

Ecrue is creating a virtual layaway and payment platform for retailers.

GoJaneGo

Morgantown, Monongalia County

GoJaneGo has designed a service using crowd-sourced knowledge, hard data and expert insight to guide companies through providing products and services to women travelers.

HiTest Ware

Summersville, Nicholas County

HiTest Ware is developing interface language for various automated test equipment programming languages.

HPTEST

Wheeling, Ohio

HPTEST is creating structural technology that increases the strength characteristics of a given structure without adding mass or weight.

Innovative Health Solutions

Morgantown, Monongalia County

Innovative Health Solutions is designing a neuro-stimulation device that can access the brain peripherally without the use of pharmacology or invasive surgery.

ITSTEM

Huntington, Cabell County

ITSTEM is creating a cost-effective solution to provide IT infrastructure for organizations that aren't capable of affording their own IT staffs.



Modulation Therapeutics

Morgantown, Monongalia County

Modulation Therapeutics is developing novel peptidomimetic drugs with reduced toxicity and increased efficacy for treating cancer.



Mountain Momma

Morgantown, Monongalia County

Mountain Momma offers a variety of products for personalizing snowboards.

Nova Chem

Charleston, Kanawha County

Nova Chem is developing methods for adapting off-the-shelf natural gas technologies to supplant traditional petrochemical refining processes.



NovelKeys

Morgantown, Monongalia County

NovelKeys designs and markets switches, keycaps, key chains and miscellaneous accessories for computer keyboards.

OI Dadz Greenhouse

Buckhannon, Upshur County

OI Dadz Greenhouse manufactures paper from eucalyptus with medicinal properties for wound care.

OpticFX

Morgantown, Monongalia County

OpticFX is combining highly efficient visual programming with synthetic turf technology to create dynamic graphic capabilities for athletic fields.



Pickatto

Wheeling, Ohio County

Pickatto is developing the first electronic guitar pick using Bluetooth technology.

Skyline Wound Care

Beckley, Raleigh County

Skyline Wound Care offers wound care services for residents of skilled nursing facilities in West Virginia.

Solar Wind Storage

Morgantown, Monongalia County

Solar Wind Storage is developing technology that converts electricity produced by solar farms and wind farms into hydrogen gas.

Sonia Gonzalez

Bridgeport, Harrison County

Sonia Gonzalez is designing a baby bottle with a prepackaged mixture of formula and water.



VoixRx

Charleston, Kanawha County

VoixRx is developing a web/mobile-based platform for patients to receive personalized instructions on medications to promote adherence to usage and enhance compliance.

Water Cube, LLC

Morgantown, Monongalia County

Water Cube, LLC is developing a new patented technology to process water.

WV Laboratories

Charleston, Kanawha County

WV Laboratories is a highly certified laboratory that performs clinical chemistry and toxicology diagnostic testing for healthcare providers.

NextUp West Virginia's Success Stories

Greasezilla™

A Fayette County Company Lands Angel Funding Through NextUp West Virginia



Thanks to U.S. EDA's and The Claude Worthington Benedum Foundation's support for NextUp West Virginia, a Fayette County company secured angel investment funding for its

innovative solution to a growing threat to the country's municipal water systems.

Ron Crosier's father created Crosier's Sanitation in Fayette County in 1965. For many years the mining industry was a valuable source of business for the company. However, when he took it over in 1995, Ron recognized the need to look beyond mining for his company's long-term growth. The company became a pioneer in grease trap management services for restaurants and commercial kitchens.



Ron Crosier designed Greasezilla™, a patented solution for managing fats, oils and grease, or FOG, waste. NextUp West Virginia helped position Ron's company for success in the angel investor market.

Commercial food preparation and dishwashing operations produce byproducts of fats, oils and grease, or FOG. If not captured and disposed of properly, those wastes can create serious problems for water systems. It's estimated that municipalities spend \$25 billion a year dealing with accumulations of grease in sewer lines.

As the company's grease trap management services began to grow, Ron recognized that traditional approaches to handling and disposing FOG waste in landfills had to change.

"The challenge became what to do with grease trap waste," Ron said. "Just being an engineer, I recognized its energy content."



Greasezilla™ is a patented solution for managing fats, oils and grease, or FOG, waste.

That's when the idea for Greasezilla™ was born.

Ron drew upon both his experience running his company as well as his background as a civil engineer to design Greasezilla™, a patented system that processes FOG waste into fuels and soil amenities that contribute nothing to landfills. It's considered to be the greenest restaurant grease-removal processing system available. Plus, Greasezilla™ operates on the biofuel it produces. The system is beginning to gain traction among municipalities as they look for solutions to dealing with FOG waste.

Thanks to U.S. EDA's and The Claude Worthington Benedum Foundation's support for NextUp West Virginia, Angel Capital Group was able to help position Ron and his company for a successful pitch to angel investors within the region. That funding is playing an important role in allowing the company to continue moving forward in a growing market.

Brian Levine, executive vice president of GreaseZilla™, said,

"Angel Capital Group's network provided the lead investor with us. When Ron realized he had a commercialized product that could be marketed, Angel Capital Group understood. Having them, as an independent third-party, do the due diligence made all the difference in allowing Ron to really move Greasezilla™ forward"

U.S. EDA's and The Claude Worthington Benedum Foundation's support for NextUp West Virginia enabled technical support that helped a wide range of entrepreneurs and early-stage and existing companies move their ideas and products forward. That support also was the enabling force for positioning some for success in pitching angel investors for funding.

The following highlights just some of NextUp West Virginia's success stories.

IstoVisio

NextUp West Virginia Introduces Early-Stage Morgantown Company to New Investment Opportunities



IstoVisio is an early-stage Morgantown company that has developed syGlass, a technology that allows massive images – 20 terabytes – collected from microscopes and MRI and CT scanners to be viewed and annotated. Designed to work seamlessly with a variety of virtual reality technologies, syGlass can produce high-resolution, immersive virtual reality renderings, 4D movies and other images quickly and easily. The end result is a deeper, more valuable insight into images, data and subjects of all shapes and sizes.

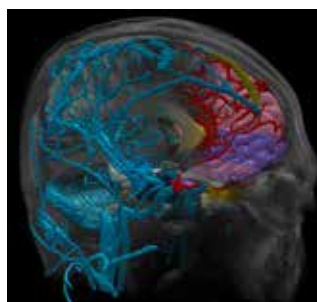


Michael Morehead, CEO of IstoVisio, is positioning his company for success in the angel investor market.

Practically applied, syGlass is introducing a valuable new visualization tool for health care and education.

syGlass' origins trace back to when Michael Morehead, the company's CEO, was a computer science graduate student at West Virginia University. It was there that Michael had an opportunity to work with Dr. George Spirou at the Rockefeller Neuroscience Institute at West Virginia University on a project to build a visualization system capable of viewing high-resolution neurons that were extracted out of electron microscopy images.

The initial technology for viewing those kinds of images included large screens that took up entire walls. It wasn't long, however, before smaller technologies such as virtual reality headsets could support high definition viewing. After some



IstoVisio's syGlass allows researchers and educators to view and annotate large, multi-dimensional, high-resolution images.

iterations in development, IstoVisio designed syGlass to be compatible with those portable devices, making viewing and learning from volumetric data more accessible.

Prestigious healthcare research institutions such as Harvard, Johns Hopkins and the Institute de la Vision in Paris are using syGlass. It also is making inroads in the K-12 education space as a cutting-edge instructional tool.

syGlass' potential for growth has attracted investment from West Virginia-based funds. With help made possible by U.S. EDA's and The Claude Worthington Benedum Foundation's support of TechConnectWV's *NextUp West Virginia* project, syGlass is attracting strong interest from an even broader angel investor community.

Michael points to TechConnectWV's investor-readiness workshops, which were led by Angel Capital Group, as having played an important role in helping him prepare his company to take the next steps in its development.

“Pitching Angel Investors: What to Expect and How to Prepare’ workshop was an excellent presentation and really helped me understand the psychology of the venture capitalist.” Michael said. “Following their advice helped me improve my pitch deck for future investment opportunities and gave me more perspective about regional groups who can help bring capital to West Virginia.”

NextUp West Virginia's Success Stories

VoixRx

Positioning an Entrepreneurial Pharmacy Student's Company for Success



Koffi Amegadje is a student in University of Charleston's School of Pharmacy.

He's also an entrepreneur.

Koffi created VoixRx, a medication counseling software, as a resource for both healthcare providers and patients. The software is designed to help patients better understand the medications they are prescribed and how to use them.

To accomplish that, VoixRx has designed a web-based platform that links to an extensive database of precise clinical information on medications. Patients also can access that information via a mobile app.

The goal is to help close communications gaps that can exist between healthcare providers and patients.

Oftentimes, a gap is created by a language barrier. To combat that, VoixRx makes written medication information available in more than 30 languages. However, the mobile app also includes an audio feature that allows the patient to listen to their medication instructions in their preferred language. VoixRx also gives healthcare providers a tool to personalize medication counseling information specifically for a patient.



Koffi Amegadje, a student in University of Charleston's School of Pharmacy, created VoixRx, a medication counseling software company.

Koffi attended TechConnectWV's angel investor workshop in September 2018, led by Angel Capital Group. It was there that he learned firsthand how investors select – and de-select – their investment opportunities. Since that workshop, Angel

Capital Group has worked closely with him to develop a business plan, financial projections and presentation materials that have positioned VoixRx as a strong candidate for angel investment.

Koffi took the time to write to TechConnectWV to share how Angel Capital Group's guidance – enabled by U.S. EDA's and The Claude Worthington Benedum Foundation's support – has made a real difference in preparing him to take his young company forward.

"In September 2018, I had the privilege to attend a business workshop by TechConnect West Virginia and Angel Capital Group to learn about the best way to pitch angel investors," Koffi wrote. "I had the pleasure to meet with various business and government leaders who attended the session; and the greatest part was being able to meet Dr. Eric Dobson and Mr. Scott Ewing from Angel Capital Group."

Koffi went on to explain how Angel Capital Group's assistance through *NextUp West Virginia* has helped him think about his company's long-term success.

"He (Dr. Dobson) believes that every entrepreneur needs to have a business mentor and positions himself to offer any help and advice possible to ensure that the entrepreneur becomes successful, whether (or not) he/she secures an investment."

At this point, VoixRx is a strong candidate to secure angel funding. The company also is negotiating an agreement with a large pharmacy software provider that would add VoixRx's product to its menu of services.

"Now that Dr. Dobson has prepared me to secure my first round of investment, I know that Angel Capital Group will help me take my company to the next level and become one of the leading healthcare companies on the market."



Kustom Doors

From a Handwritten Drawing to the Market



Mike Jude and his wife were searching for over-the-door storage for their bedroom. Not satisfied with what they were finding,

Mike shifted their search for a door with built-in storage. Again, Mike found that a sensible answer didn't exist. That's when he developed the idea of building high-quality doors that offer a unique built-in storage solution.

Through what he says was the result of teamwork among many people and organizations, Mike designed and built a prototype but needed help in making some refinements to it, especially around the molded storage inserts. He also wanted to add an element of security to his storage solution. Thanks to EDA's and The Claude Worthington Benedum Foundation's support for NextUp West Virginia, the Center for Applied Research and Technology (CART) was able to provide Mike with the expertise he needed to design a radio frequency identification (RFID) locking mechanism that could provide a valuable level of security to his product.

Mike says CART has been one of the most integral parts of his team.

"I asked CART for help in designing a digital lock for my product," Mike said. "They have not only developed, built and tested an electronic lock but they have also developed, built and tested a lower cost magnetic locking system and have worked closely with me to develop, build and test a customizable storage insert that goes above and beyond what I thought we could do."

As he worked with CART to refine his prototype, Mike began to consider how bringing on investors could help him move his start-up forward. Learning what investors look for and funding options that might be available can be overwhelming for an entrepreneur. Again, through *NextUp West Virginia*, TechConnectWV was able to introduce Mike to Angel Capital Group, who has helped Mike learn how investors select – and de-select – their investment opportunities.



Mike Jude has designed and patented a unique, secure alternative to traditional over-the-door storage solutions. NextUp West Virginia helped position Mike for success in the angel investor market and with a national retailer.

Mike says he considers ACG, like CART, to be a part of his team.

"I was lucky enough to be invited to meet with ACG and discuss my product with them at the beginning of my journey," Mike said. "They took the time to discuss every aspect of my pitch, ranging from my financial projections to my marketing plan. It's funny now to think of how nervous I was at that first pitch meeting. Now I don't think anything more of contacting them as I do any other part of my startup team."

The support that Mike received through *NextUp West Virginia* allowed him to develop a working prototype of his unique home storage solution, become a strong candidate for angel investment, and map out a path into the market.

"As an inventor and entrepreneur, I have journeyed from a handwritten drawing of an idea to a granted utility patent, a third-generation prototype of my product and a working relationship with a national retailer to bring my product to the market in the near future."

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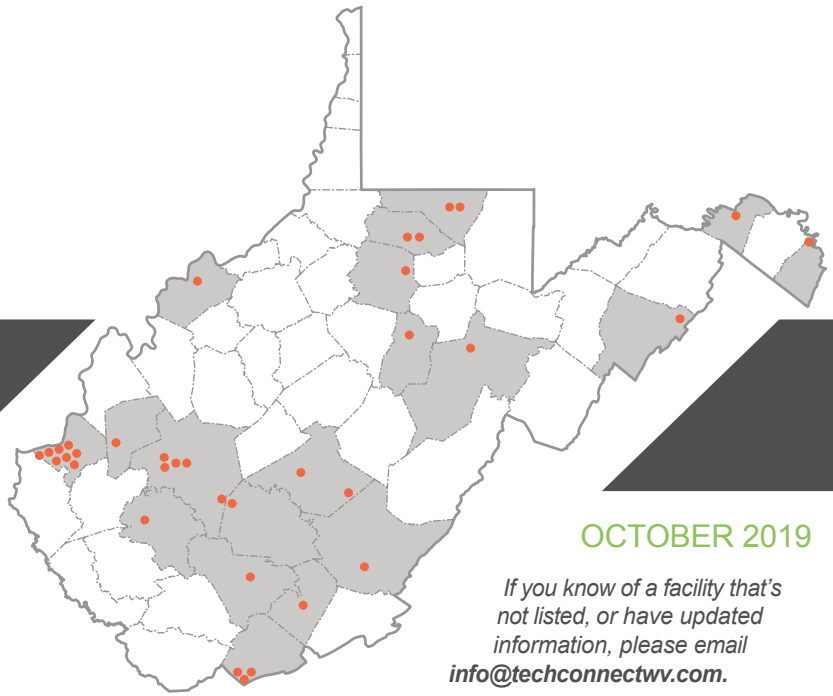
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NextUp West Virginia's Media Coverage

The following represents media coverage related to *NextUp West Virginia* and some of the entrepreneurs and companies that were assisted through U.S. EDA's and The Claude Worthington Benedum Foundation's investment in the project.

The following article appeared in the June 6, 2018, edition of The Exponent Telegram.

Regional Entrepreneurs Receive Training on Angel Investors

By John Mark Shaver, Staff Writer

FAIRMONT — Hoping to attract new capital to West Virginia, TechConnect West Virginia held a seminar Wednesday morning to help regional entrepreneurs and companies strengthen their investment pitches.

The workshop was held at the Robert H. Mollohan Research Center as part of TechConnect's *NextUp West Virginia* program focused on teaching entrepreneurs what angel investors look for in potential investments.

An angel investor provides starting or growth capital to promising ventures and helps with advice and contacts.

TechConnect West Virginia Executive Director Anne Barth said that with the workshop, more companies across the state will become more investment savvy, leading to more revenue in the future.

"We have representatives from various incubators and accelerators from around the state because we want them to learn about what angel investment groups are looking for in investments so that they're better educated to go back and work with entrepreneurs and researchers and small businesses and be better prepared to make that connection," she said.

During the workshop, the Angel Capital Group sat with those in attendance for one-on-one meetings on ways to improve their pitches.

Barth said the workshop is one of several projects sponsored by NextUp West Virginia, which aims to bridge the divide between entrepreneurs and investors. The program began in October 2017 and, based on its current funding from grants, it will run through September 2019. Barth said the program has three main goals for the West Virginia economy.

"The first is to provide technical assistance to small businesses and entrepreneurs through our centers of excellence in the state," Barth said. "The second component is improving

access to capital. This investor readiness workshop is part of that to help introduce some of our new companies and partners to the Angel Investor Network in the region outside of West Virginia and to help them learn how to better pitch. If we can get them in front of an angel group, they're more likely to get funding.

"The third component of the NextUp grant is to strengthen the network with incubators and accelerators around the state so they can kind of learn from each other and share best practices and be stronger in their own communities in their efforts to launch companies."

One of the many representatives in attendance was Mountain State Capital Managing Director Mike Green, who said workshops like this give him a great outlet for networking and reaching out to those who can make a positive difference for the state.

"The goal of Mountain State Capital is to provide funding and mentorship to those worthy entrepreneurs that need funding, contacts and mentorship in order to make their companies successful," Green said. "We have a number of people who are in that particular cohort who have good ideas or exciting opportunities or providing a product or service.

"I hope we're able to encourage people who have good ideas to make sure they find people who can help them nurture those ideas and provide them funding to make them successful for the future."

This was the first of several statewide workshops to take place in West Virginia, and Barth said that with a little bit of work, the information learned at these workshops will lead to more prosperity than the state has seen in quite some time.

"If we can create jobs here at home in West Virginia, there's a better chance of keeping those companies here," Barth said. "That's our end goal: To create jobs and generate wealth in West Virginia."

The following article appeared in March 24, 2019, edition of The State Journal and on its NCWV Media sister companies' websites.

TechConnect Highlights WV Innovators Such As Greasezilla, Others

By Conor Griffith, Business Editor

CHARLESTON — Through a series of programs and grants from the federal government, the non-profit coalition TechConnectWV has helped shine a light on some of the most innovative companies in the world which are based in the Mountain State.

Anne Barth, director of TechConnect, said the organization has worked to foster innovation through a number of programs such as Start Up West Virginia, which was an integrated initiative from 2012-2014 that was designed to expand entrepreneurial and business startup efforts that helped to create new tech-based jobs in high-growth industries in West Virginia with funding from the U.S. Economic Development Administration (EDA).

More recently, TechConnect has launched NextUp West Virginia, which is intended to help new companies and existing companies acquire training and next-stage commercialization assistance. This too was made possible by EDA funds, along with support from the Claude Worthington Benedum Foundation and technical assistance from the state's Centers of Excellence such as the Chemical Alliance Zone, the Center for Applied Research and Technology and the INNOVA Commercialization Group.

"We have continued that model of leveraging the in-state Center of Excellence," she said. "We added two new components, and one of them was around the whole concept of Angel Capital. We know West Virginia — like much of the country, if you don't live on the coast — has an issue with accessing capital for new start-ups, and we wanted to form a relationship with Angel Capital Group out of Knoxville, Tennessee, and they've been working with us to offer training for entrepreneurs."

NextUp, Barth said, is ultimately about showing the state's entrepreneurs how best to pitch their concepts for capital funding and what not to do during this process. She said one firm so far, Fayette County-based Greasezilla, has landed investment capital from Angel Capital.

Greasezilla Vice President Brian Levine said the company was established by entrepreneur Ron Crosier, who already ran Crosier Sanitation and Downey Ridge Environmental Company after noticing the problem posed by commercial kitchens in the form of fats, oils and grease or FOG.

He explained that if FOG isn't disposed of properly, which can be very expensive, the substances get into municipal sewage systems, which can cause all the same problems as pouring bacon grease down the kitchen sink — albeit on a larger scale. He said this problem costs cities across the country \$25 billion a year to address.

Greasezilla began as an extension of Downey Ridge.

"They were picking up grease traps as part of their operation, and they had the same problem as everyone in the world, not just the U.S.," Levine explained. "What do you do with it when you pick it up? It's very difficult to find places that will take it and it's costly to manage it. This was a mother of invention necessity."

The solution was in the company's patented Hydronic Separation System which disposes of the FOG while producing biofuel and leaving behind brown grease which can be sold to energy companies since it's used in making biodiesel and be used as a heating substitute among other applications.

As a bonus, this process runs off the energy it produces, doesn't emit greenhouse gases because FOG is organic in composition, has minimal labor requirements, is easy to maintain and leaves nothing behind to send to the landfill.

"Some of our customers not only use the fuel to manage the system which is part of the patented process but they'll use the fuel inside the very building or buildings on their premises for water, heating and ventilations," he said.

Greasezilla's facilities can now be found in Massachusetts, the U.S. Virgin Islands, Long Island and Chile's capital city of Santiago while plans are afoot to open another site in Virginia.

Levine said Greasezilla routinely gets calls from South America, the Middle East and South Africa as growing economies throughout the world wish to get ahead of the curve regarding FOG disposal.

"When best practices can get the price down to one cent per gallon, there's no incentive not to embrace them," he said, adding that the people now demand it as the public has become more interested in how waste is disposed of.

Levine said the story of Greasezilla should be a source of pride for the state because it demonstrates West Virginia's technological, engineering and heavy equipment prowess to the world and its ability to overcome tough problems with innovation.

Barth said the goal of NextUp is also to help small business incubators and start-ups achieve the same kind of investment success as Greasezilla.

The following op-ed by Kevin DiGregorio, Executive Director of The Chemical Alliance Zone, appeared in the August 9, 2018 edition of the Daily Mail West Virginia.

ChemAssist Growing Companies and Creating Jobs

By Kevin DiGregorio

Get this. In less than six months, Dunbar-based Burly Boy Beard Products has created one job, increased market presence from one store in one state (WV) to 16 stores in five states (adding North Carolina, Oklahoma, Texas, and Oregon), increased website sales 500%, developed three new scents (Refresh, Night, Old School), added a number of new products, including beard butters, shampoo, and muscle rub, and opened an Etsy store and an Amazon store.

Oh yes, and in that same span, Burly Boy, which provides beard, skin and facial care products for men, also increased its web-based following (Facebook and Instagram) over 10-fold, signed five ambassadors to promote the company, and obtained an advertising slot soon to be in over 140 bars, hotels, and restaurants in North and South Carolina.

Not to get too ho hum on you after all of that, but the company also ... well ... formed the company in that span, created a new website (www.burly-boy.com), and now has plans to open a storefront in Dunbar and boost store presence to include Tamarack, local Wal-Marts, and Target.com.

Nice.

The Chemical Alliance Zone (CAZ) and our partners, including TechConnectWV and the Charleston Area Alliance, are pleased to have played a key role in Burly Boy's success. Located at the West Virginia Regional Technology Park (WVRTP), CAZ houses an incubator (ChemCeption) for chemistry-based start-ups and runs a program (ChemAssist) that provides assistance to chemistry-based entrepreneurs across the state with funding provided by grants from the US Economic Development Administration, the Benedum Foundation, and the WV Department of Commerce.

In this case, CAZ provided business guidance and consultation to Burly Boy along with funding for company formation, product manufacturing, and website development and other marketing activities.

We often talk about inspiring entrepreneurs, launching companies, and sparking innovation in West Virginia. And for good reason. That's the kind of activity that leads to long-term job growth, enduring wealth creation that can be put back into the community, and a more diversified economy.

But as ChemAssist shows, we and others across the state are no longer just talking about it, but we are doing it. In fact, through ChemAssist alone over just 2.5 years, we have assisted 60 start-ups or small firms, helped retain over 35 jobs, helped create at least 3 jobs, and assisted companies in obtaining over \$3 million in follow-on funding. We have also helped companies develop over ten new processes or products, obtain two patents, and land well over ten new partners or customers.

The companies we support range from our one-person environmental consulting firm at WVRTP, EnviroCalc — who has contracts with several large chemical firms — to companies like Preiser Scientific and Cyclops Industries that have been serving the chemical and energy industries for several decades.

One company in our ChemCeption incubator, Keen Process Technologies (KPT), is led by Dr. Brian Keen, a former Union Carbide and Dow scientist who has 35 patents and has commercialized over a dozen new technologies in his career. Brian is now developing three very promising technologies, including one disruptive process to produce high octane gasoline (potentially from Natural Gas Liquids).

Among other things, CAZ provided guidance and feedback to KPT on proof-of-concept studies, patent issues, and partnership strategies. We also helped develop pitch slides and documents for potential partners and investors and are now working with KPT to find partners or investors to advance and commercialize the technology.

The work on all three KPT technologies has been conducted by MATRIC at WVRTP, with much of the funding provided through ChemAssist. We hope any future development will be done at WVRTP as well.

As noted by just the few examples above, the variety of companies we are supporting through ChemAssist is quite broad. Thus, both Bullock Distillery and Mountain State Distillery, two new start-ups in Charleston that are developing production facilities with tasting rooms for high-end spirits, fit right in.

CAZ has worked with both companies, offering advice but also providing funding to enable commercialization and start-up. Their success will not only create potentially five to ten jobs or more but will also add to tourism efforts, maybe even leading to a bourbon trail or something similar in the future.

Sometimes our assistance leads to more rapid commercialization. As John Bullock of Bullock Distillery stated, "With the purchase of barrels from the ChemAssist grant, we will become a full-scale distillery at least one year and maybe two years sooner than we would have otherwise."

And other times our assistance makes innovation or commercialization possible. Or as Dr. Keen of KPT said about ChemAssist, "I would not have been able to prove the feasibility of these three technologies to attract partners and investors without this program."

Individually, these start-ups represent small growth in job numbers, but each job created is revenue to the area, helps someone be employed here as opposed to finding work out of state, and incrementally grows our economy. It also helps suppliers and others who are assisting these companies. Plus, it provides the opportunity for much bigger job numbers in the future if one or more of these start-ups hit it big. That's what a strong, diversified economy is all about ... lots of small advances that collectively adds strong growth across the region.

And that's what ChemCeption and ChemAssist are all about as well — boosting entrepreneurship, launching companies, increasing innovation, and creating jobs — definitely at WVRTP, but also across West Virginia from the confines of WVRTP.

The following article appeared in the March 19, 2019, edition of the Charleston Gazette-Mail.

New Distillery in Charleston Hopes to Be a Destination for Visitors

By Bill Lynch

People have been looking through the windows and trying to peek into Mountain State Distillery at the top of Capitol Street in Charleston, from almost as soon as it was announced — about a year ago — that a distillery was going into the building.

Jeff Arthur, the owner of Charleston's first (legal) micro-distillery, laughed and said, "I've had them looking in at me at all hours. I'll come in late at night to work and there have been people trying to see what I'm doing."

The 45-year-old said he likes to watch the curious faces.

The outside glass of the windows is tinted, making it harder to see in, but it's perfectly clear to look out.

"It's pretty funny to watch," he said.

Sometimes, passersby have come to the door, rattled the handle or knocked, asking for a sample.

"If I'm not too busy, I'll let them in," Arthur said.

Now, people won't have to bang on the door to get a taste of Mountain State Distillery's whiskey.

At long last, Mountain State Distillery opens today with a ribbon cutting ceremony at 1 p.m. and whiskey for sale on the premises. Arthur hopes the city, the county and beyond will embrace his Southern Blend brand.

The Southern Blend is a bourbon mash whiskey made with corn, wheat and barley, which gives it a soft, lightly sweet flavor.



Technically, Southern Blend could be classified as a bourbon, though a very young one. The 86-proof spirit has the right DNA. It's aged in oak barrels. But while most bourbons are aged anywhere from a couple of months to several years, which gives the liquor time to absorb some of the flavors of the barrel, Southern Blend is aged just five weeks.

Arthur isn't interested in wrestling with bourbon purists. Like Jack Daniels, he calls it something else.

"I call it a whiskey," he said.

It's also just the beginning.

"It's our first product," Arthur said. "I wanted to start out with something nobody else was doing, but once we get settled, I'm looking into expanding what we offer."

Arthur said that would likely be different moonshines and probably gin.

"I could do a version of rum," he said. "But my track record with that is a little hit or miss. One time, what I came up with was really good." He frowned and added, "Another time, not so much."

Made with molasses, rum can gum up the equipment if you're not careful, Arthur explained.

For now, Arthur said he was happy to offer Southern Blend, which will be available through walk-in sales and at several area restaurants and bars.

Bridge Road Bistro on Bridge Road has had Arthur's whiskey on its shelf for a couple of months now.

Opening a distillery has been a long time coming for the Fayette County native. While he is cagey about saying when exactly he started making whiskey, he acknowledges that his interest goes back many years.

"I knew people who were old-time moonshiners and whiskey makers," he said. "I'd say I was interested in the process from almost as far back as I can remember."

His first stills were small, hobby-sized set ups, he said. He said he always focused on reliability and safety.

"You've got people out there who'll try to take an old radiator and make a still out of it," he said.

Arthur didn't recommend that.

Over the years, Arthur said he experimented with small batches of different recipes, figured out what he liked and refined it a little.

His commercial operation is much larger than anything he had at home. It's just two small stills, purchased from a specialty manufacturer in Kentucky. Between the two, the stills can produce 10 to 12 gallons of whiskey a day.



“That’s at full blast,” he said, adding that Mountain State Distillery’s full production would scarcely be a splash in the ocean compared to how much whiskey an internationally known brand like Jack Daniels can churn out.

The Tennessee sipping whiskey produces 150 million bottles a year.

Mountain State Distillery won’t even make as much as Smooth Ambler, the craft distiller in Greenbrier County — at least, not any time soon.

Size is relative, Arthur said.

“I could have started with a larger set up,” he said. “But a 250 gallon still isn’t for me. I like the smaller stills because you can control flavor much better.”

The distillery owner said if things go well, he hoped to expand and open a second location which would only house distillery equipment.

“I would keep the store here,” he said.

Any expansion would probably be in a few years’ time. Just getting his distillery and tasting room approved, constructed and up to code for various government agencies was a slow process. Even finding a location where he could set up shop wasn’t easy.

“Just setting up a business isn’t easy in Charleston,” Arthur said. “Some of the people who own buildings don’t want to take a chance on a retail operation. They’d rather keep their property empty or rent it out to someone to use as storage.”

While he’s from Fayette County, Arthur said he’s lived in the Charleston area for years. It’s his home and he said he’s watched the city decline for years. He believes the city needs things like his distillery to attract tourism to the area.

“When you walk downtown, you want to find things to do, things to see,” he said.

Mountain State Distillery would only be a drop in the bucket toward re-invigorating the city, but the drops add up until they become something.

Experts Say WV's Biosciences Industry Continues to Grow

By Conor Griffith Business Editor

MORGANTOWN — Although small compared to others, the biosciences sector in West Virginia is nonetheless potent, and it only expects to get stronger with policy changes and new research underway.

"The 'biosciences,' or life sciences, have to do with both the study of the biology of all living things and the commercialization of discoveries that may result from that research," explained Bryan Brown, executive director of the Bioscience Association of West Virginia. "The bioscience industries work to help heal, feed and fuel the world."

He said these industries continue to grow research that is taking place at institutions such as West Virginia University or Marshall University, which often lead to the creation of start-up companies. Some of the work of these new companies were on display in Monongalia County during the 9th West Virginia Bioscience Summit.

One of them was Morgantown-based software company IstoVisio Inc., which specializes in the counting and visualization of advanced data on computers and virtual reality systems such as Oculus Rift.

"Looking at data is great, but if you can't quantify what's in there, it's useless for researchers," said IstoVisio CEO Michael Moorehead. "It's almost 2020, and we don't have 'ying cars, but we almost have holograms."

He said technology such as this can help researchers and companies better convey information with each other. This also has application in schools since students can much more easily comprehend subjects like parts of a human cell if it's displayed in 3-D in virtual reality rather than a 2-D image in a paper textbook.

Moorehead said another potential use is the study of physical injuries such as those that might be suffered by a race horse. He added that since this technology does not require FDA approval, it is in many ways an open playground.

Brent Fisher, CEO of SelenBio Chemical Inc., said his company specializes in selenium-based biofilm formation that guards against fungal and bacterial colonization.

He said the original application was to be in dentistry, but the tech now shows potential in the testing of catheters, antifouling coating that can be used by the military and civilian maritime industry and even in the development of reusable wound-care bandages.

"We think it'll cross a lot of different fields," Fisher said, adding that West Virginia's history of chemical expertise made it all rather fitting.

Other biotechnology companies based in the Mountain State continue to make strides in the fields of medical treatment, improved veterinary medicine and more efficient lab testing.

Richard Giersh is the CEO of Valtari Bio, a medical bioscience company that spun out of research at WVU to develop blood tests that can detect strokes. He said the bioscience field offers plenty of economic benefits to the state, in addition to social or technological ones.

For instance, he said the industry's average wages are about \$75,000. While there are 7,800 people employed in these various companies, that number is expected to grow.

"A lot of our organizations are actively seeking to add employees," he said. "The future is truly bright, and we are excited about the direction we're going."

Brown said new bills passed during the 2019 legislative session will help speed things along. An example of this is HB 2550, which is legislation creating the Small Business Innovation Research (SBIR) State Matching Grant Program, which will grant state funding to small businesses who receive the SBIR funds from the federal government for researching new technologies or software.

"The passage of this legislation, which received widespread support among policymakers, signals an understanding by lawmakers of the need to support the entrepreneurial, innovation economy," Brown said. "West Virginia's bioscience industry, while small compared to many other states, is growing."

Brown said the state's bioscience firms grew their employment base by 14 percent from 2014 through 2016, well outpacing national growth of 4.4 percent to reach nearly 8,000 total industry jobs, according to an industrywide study released in mid-2018.

Despite the potential for growth, there are still obstacles to overcome. Moorehead said one of them is transportation infrastructure. Having to take international trips to showcase his company's technology, he said West Virginia needs to seriously improve its use of airports and connectivity.

"I cannot continue to drive up to Pittsburgh every single time I leave the country," he said.

Semplastics Wins \$1.5 Million Department of Energy Grant for West Virginia Coal-Infused Roof Tiles

X-MAT® uses coal to create eco-friendly, safe product

BLUEFIELD, W.Va. (August 6, 2019) – The dream of turning Appalachian coal into super strong roof tiles, that will make America’s homes safer, is one step closer to reality.



Semplastics, through its Advanced Materials Division, X-MAT®, has secured a second Small Business Innovation Research grant from the Department of Energy’s National Energy Technology Laboratory (NETL). The award was given for the development of its value-added coal roofing product, the X-TILE™. The Phase 2 grant provides the company with \$1.5 million.

X-MAT® roofing tiles are lightweight, fireproof and can withstand extreme temperatures. They also have higher flexure strength than ceramic roof tiles currently available on the market.

X-MAT® CEO Bill Easter said, “There is a great deal of excitement about the progress we made over the last year and we are looking forward to the next phase. We are very thankful to the NETL and our friends in West Virginia for helping us secure this critical grant.”

Easter continued, “The value of the roof tiles is more than just science. The success of this next generation of roofing tiles makes America’s homes safer and leads to a productive way to use coal. It is our mission to use X-TILE™ technology to provide jobs and future manufacturing in the Appalachian region.”

X-MAT®’s progress on the tiles was made possible by an initial Department of Energy grant. Through a partnership with West Virginia’s Center for Applied Research and Technology (CART), the company was able to create a first-generation prototype of the X-TILE™.

The X-TILE™ uses X-MAT®’s innovative composite material, which combines the properties of metals, plastics and ceramics in one unique material. X-MAT®’s coal-core composite is made of a polymer-derived ceramic that when mixed with coal, does not burn the fossil fuel. As a result the process reduces the carbon footprint for both the roofing and coal industries in the Appalachian region.

About X-MAT®, the Advanced Materials Division of Semplastics

X-MAT®, the Advanced Materials Division of Semplastics, launched in 2013. X-MAT® developed a revolutionary high performance material that combines some of the best properties of metals (electrical conductivity), engineering plastics (lightweight) and ceramics (high operating temperature). X-MAT® has had several partnerships including work with NASA, Space Florida and the NETL. X-MAT®’s game-changing material has various current applications including fireproof roof tiles, lightweight space mirrors, battery electrodes and 3D printing ceramics. X-MAT® technology can be custom-engineered to fit many specifications and has unlimited potential market applications. To learn more about X-MAT® capabilities and future projects, visit their website at <https://www.x-materials.com> or call (407)353-6885.

The following article appeared in the June 10, 2019, edition of *The State Journal* and its sister media outlets.



IstoVisio's syGlass Helping Researchers Across The U.S. and Europe

By *Conor Griffith Business Editor*

MORGANTOWN — What began as student research at the WVU Rockefeller Neuroscience Institute has grown into a biotech start-up offering a product that could improve medicine and education across the country.

IstoVisio Inc. developed and commercialized syGlass, a scientific data visualization and annotation system built from the ground up that allows high resolution polygon meshes, 4-D movies and volumetric imaging data to be viewed seamlessly through virtual reality technologies such as the Oculus Rift or HTC Vive. Such capabilities are proving useful to researchers around the country.

"Currently, 90 percent of our customers are basic research scientists, so that's neuroscience, structural biologists," explained Michael Morehead, the company's CEO. "There are some people in anatomy that are interested in MRI scans and CT scans. It's always good to show an image of a chest or a skull or something like that."

Lately, Morehead has presented syGlass at Stanford University, Texas A&M and the University of Texas at Austin. The technology has also been showcased abroad for L'institut De La Vision, a French research center dedicated to eye diseases, and The Pasteur Institute, a Paris-based non-profit private foundation dedicated to the study of biology, microorganisms, diseases and vaccines.

This all started with academic research being pursued when he was still a student in Morgantown.

"I was embedded in George Spirou's research lab," Morehead said. "He was, at the time, director of the Rockefeller Neuroscience Institute at West Virginia University. I was a grad student in computer science and was interested in finding a Ph.D. masters project that sort of combined my interest in medical technology and computer science. He just got an R-20 grant, which is high risk/high reward, to build a visualization system to view these very high resolution neurons that he was extracting out of electron microscopy images."

Morehead explained that the ideal way of viewing this, at least back in 2013, was through a smart TV in which the screens took up entire walls and took up the entire room called a Cave.

"You can stand inside a room, and all of the walls show you an interactive virtual environment," he said. "You can put a lot of people into a room, and they can all experience it all the same time. We built one in the neuroscience center and I learned a lot. As soon as we got it finished, we became the stop on the VIP tour of the university, so we had semi-famous people from the state coming through."

While Morehead said this was a good experience for technical development, major changes were just around the corner.

Shortly after the Cave was completed, virtual reality headsets like the Oculus Rift started hitting the market and in the process, it nullified a lot of the downsides of the Cave concept. The Rift is portable and was much cheaper than the older concept at \$800 per set.

From there, it was a matter of porting the wall screen functionality to the headset with a development kit.

"As we did that, we developed a couple iterations, and it started to turn out to be pretty cool and visiting scientists who were giving talks or on campus in general would be brought to see this headset system," Morehead explained. "At first, we were going to open source the code and release it to the scientific community, but so many of those scientists who were visiting kept telling us, 'Wow, this is really interesting. I want this in my lab. I would pay money for this.'"

Morehead said he and his colleagues decided not to open source it in the end because by selling it, more engineers could be hired to continue improving and experimenting with the original concept.

WVU's Office of Technology Transfer was supportive of the project, and a few small grants later, the concept was debuted at the Society for Neuroscience in 2016 for feedback. Morehead said the product wasn't for sale yet, but several of the 300 or so scientists who saw it were flashing their credit cards.

Since IstoVisio was launched in earnest a few years ago, syGlass can be found at 50 universities. The startup is also looking to build partnerships with larger medical and technology companies.

Morehead said syGlass also could come in handy in grade schools since students would be far more engaged by a detailed image than a sketch in a textbook. He said something like this could make anyone feel like Tony Stark from the Marvel movies.

Still, even with all of the system's potential, Morehead said the commercialization process would not have been possible without seed money from the West Virginia Jobs Investment Trust and the INNOVA Commercialization Group at WV High Tech Foundation.

IstoVisio was one of several West Virginia-based companies to share its work during the 9th annual W.Va.Bioscience Summit in April.

Bryan Brown, executive director of the Bioscience Association of West Virginia, praised Morehead and his team for its accomplishments so far and said it's an example of what can be found in Appalachia.

"Frankly, their syGlass system is a perfect example of the technology coming out of West Virginia," he said. "It's that kind of nexus between virtual reality and computing and biomedical analysis... from a bio industry standpoint, I think it's a great convergence of technology they put together that I think will be very useful as they continue to commercialize."

He said IstoVisio isn't like a typical biotech company that's manufacturing drugs but rather has found a niche use for the computer technology they developed to solve complex problems.

"I'm glad they developed it in West Virginia," Brown said, adding that IstoVisio's path from academic research to commercialization is the best way for developments like this to happen.



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