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Life Sciences in the Keystone State

2016 | Volume 1 Issue 3

PENNSYLVANIA DEPARTMENT OF COMMUNITY & ECONOMIC DEVELOPMENT

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– Bob Kessler, President & CEO of Kessler's, Inc.

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Welcome to the third edition of Pennsylvania Economic Quarterly. This edition focuses on the leading and highly concentrated bioscience industry in Pennsylvania, particularly pharmaceuticals; research, testing, and medical labs; medical device manufacturing; and diagnostics sectors.

Together, these four industries are responsible for groundbreaking research, medical devices, and pharmaceuticals that save lives and fuel innovation. Ranked third in the United States for biotechnology growth potential and industry strength in drugs and pharmaceuticals, we are consistently placed among the top tier in the nation in key measures of R&D, innovation, venture capital investments, and patenting. In fact, we were ranked fifth on a list of best states for medical device companies in 2014.

The life sciences industry employs more than 78,000 Pennsylvanians in over 2,300 establishments. To showcase just how diverse and widespread the industry is, 10 life sciences organizations recently launched the first-ever Life Sciences Ecosystem Map. From therapeutic to digital health, this interactive database highlights life sciences companies doing business here in Pennsylvania.

Pennsylvania remains at the forefront of biological innovation, and businesses can find the national model for state funding of early-risk capital in the biosciences right here. With the fourth largest amount of National Institutes of Health funding in the nation, the state offered more than $1.5 billion to organizations across the commonwealth in 2015.

Incubators across the state host the resources to make scientific ideas a reality. Three Life Sciences Greenhouses also provide access to capital, as well as investors and expertise to biotech and medical device startups.

If you're ready to lead the way with these established industries in Pennsylvania, our team of skilled professionals is ready to help meet your needs. Whether you are growing from within our borders or across the globe, Pennsylvania has the experience, imagination, and vision to help you find success.

Sincerely,

Tom Wolf
Governor

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As Philadelphia's public university, Temple infuses the city and the commonwealth with energy, ingenuity and practical resources. Its faculty and students bring an uncommon drive to their quest to make a difference in the community, the region and the world.

- Annually, the university generates nearly $4 billion for the city and more than ***$6 billion*** for the commonwealth.
- Temple is the fourth-largest private employer in Philadelphia and supports ***71,000 jobs*** in Pennsylvania.
- The university's alumni network numbers more than ***300,000*** strong worldwide, with more than half living in Pennsylvania.
- Temple's research enterprise ranks in the ***top 100*** in funding according to the National Science Foundation.

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Life sciences clusters span Pennsylvania as the state continues to support growth.

by CRYSTAL VILLARREAL

Secretary of Community & Economic Development Dennis M. Davin talks about the wealth of resources and research opportunities available to the life sciences sector in an in-depth interview with Pennsylvania Economic Quarterly.

Pennsylvania is consistently ranked in the top tier across all states in key measures of bioscience R&D and innovation. What assets does Pennsylvania have that contribute to this ranking?

DAVIN: We have many assets to offer companies in life sciences industries, particularly in the biotechnology, pharmaceutical, medical device, and diagnostics sectors. Simply put, we bring together a great mix of resources that fosters an environment of innovation and supports the growth and expansion of our companies. This includes Pennsylvania's concentration of companies working on new products and processes, our university system contributing talent and pushing out new innovations, and a collection of incubators across the state helping to commercialize new technologies and products.

These resources help us achieve top-notch rankings in the key measures for the life sciences industry and subsectors. We are third in the nation for biotechnology growth potential and industry strength in drugs and pharmaceuticals. Pennsylvania is also ranked fourth for our R&D expenditures and research, testing and laboratory facilities, and fifth for life science-related patents and bioscience venture capital investment. We're proud to be home to two of the top six National Institutes of Health (NIH)-funded research institutions, and our state received the fourth-largest amount of NIH funding in the country in 2015.

When it comes to industry clusters, many are familiar with Philadelphia and Pittsburgh, when in truth, life sciences clusters exist all across our state. Thanks to our robust life sciences infrastructure, we constantly see new and exciting technologies and discoveries led by our companies. Our companies are a testament to the opportunity in our state.

Global medical device manufacturer and pharmaceutical company B. Braun, located in the Lehigh Valley, recently launched the first and only comprehensive IV kit supporting ultrasound. Meanwhile, Philadelphia-based advanced nanotechnology manufacturer Graphene Frontiers is aiding in the development of high-quality graphene and its use as a medical diagnostic tool — a process for which the National Science Foundation awarded them a significant grant.

FlowMetric, Inc. is a leading provider of flow cytometry and cell sorting services in Bucks County. They provide support during all stages of drug development and serve clients in biotechnology, hospitals, academic institutions,

211
new companies & projects funded

$3.2
Billion private follow-on funding

$105.1
million federal follow-on funding

175
life-saving patient care products

"Thanks to our robust life science infrastructure, we constantly see new and exciting technologies and discoveries led by our companies."

— Dennis M. Davin, *Secretary of Community & Economic Development*

and pharmaceuticals.

Central Pennsylvania-based Actuated Medical uses motion technologies to improve medical devices, focusing on minimally invasive tools for clearing occlusions and penetrating bone and tissue. MG Development, a French designer and manufacturer of hearing aid cleaning products, chose to locate its North American headquarters in Pittsburgh, employing 50 people with plans to at least double in the next several years. DeVilbiss Healthcare's principal corporate headquarters and manufacturing facilities for respiratory medical products are located in Somerset, with distribution centers located around the globe.

Our universities are well-funded by the NIH — we had two universities in the top 10 highest-funded organizations in 2015. In addition, four of the top 50 universities in the country are from Pennsylvania, and our universities are among the top-ranking universities that grant the most Science, Technology, Engineering and Mathematics (STEM) degrees. Research is integral to the state's academic and scientific influence — Pennsylvania ranks fourth in the U.S. for its R&D expenditures.

One of our top universities is Penn State University, which has dedicated life science research happening at The Huck Institutes of the Life Sciences. Not only are the Huck Institutes preparing students for critical careers, but they also encourage collaboration among other research centers within the university. Some of the most recent developments include the use of sound to separate cancer cells from blood samples, the discovery of a gene that controls the melting point of cocoa butter, and a new collaborative gene research project with Geisinger Research.

On the western side of the state, the startup Sharp Edge Labs, the brainchild of two Carnegie Mellon University faculty members, uses chemical dyes to sort through hundreds of thousands of drug compounds to find ones that can fix the genetic causes of particular diseases. The use of high-speed robotics increases the speed of screening the drug compounds by 1,000-to-one over conventional developmental methods.

We also host dynamic incubators working to commercialize new technologies in the marketplace. In Philadelphia, the University City Science Center stands as the oldest and largest urban research park in the United States. Since 1963, more than 350 organizations have graduated from the Center. About one hour north, the Pennsylvania Biotechnology Center of Bucks County offers a 62,000-sq.-

ft. facility that provides space for biotech entrepreneurs and small businesses to establish themselves and grow in Pennsylvania. Lastly, the Pittsburgh Life Sciences Greenhouse, a nationally-recognized investment firm, has assisted more than 435 life sciences companies and helped create and retain more than 1,500 jobs in western Pennsylvania, which represents a substantial contribution to the region's economy.

Is Pennsylvania still attracting new life sciences, medical device, and diagnostics companies?

DAVIN: Pennsylvania remains a magnet for companies across all three of those industries, due in part to Governor Tom Wolf's commitment to provide funding for the life sciences sector as a whole, and to increase support for research for future growth within the industry. This only encourages our already constant expansions and relocations in the state. We have many recent examples to share as evidence of our continued growth.

Adaptimmune Therapeutics, a clinical-stage biopharmaceutical company focused on developing cancer immunotherapy treatments, recently announced that the Food and Drug Administration (FDA) has granted "breakthrough therapy designation" for its TCR-engineered T-cell therapy to treat cancer. This means the FDA will expedite its development and potentially save the company years of review and development. In addition, the company is building a manufacturing facility and U.S. headquarters at the Philadelphia Navy Yard to accommodate recent growth.

Cook MyoSite, Inc., also a clinical-stage biotech firm, chose to expand in Pennsylvania as well, creating 64 full-time jobs at its facility in Allegheny County. MyoSite is another example of a successful startup with university connections, having stemmed from research conducted at the University of Pittsburgh, specializing in human cell regeneration. The company will invest at least $26 million to build its new manufacturing facility.

What kind of support is offered to companies in these industries from the state or other entities?

DAVIN: The state offers both financial and educational assistance to companies in the life sciences, medical device manufacturing, and diagnostic industries. In Pennsylvania, the state funding flows through state-run programs and strategic partners to reach appropriate businesses. One such program, the Ben Franklin Technology Development Authority (BFTDA), is a nationally and internationally recognized model of technology-based economic development. The BFTDA approves funding for the Ben Franklin Technology Partners (BFTP) who provide critical seed and risk capital to technology companies across the commonwealth. In 2014, the four regional BFTPs assisted 1,125 companies, launched 311 new products and processes, created 1,103 jobs, and retained 1,224 jobs.

The Pennsylvania Life Sciences Greenhouse (PALSG) initiative is another valuable resource, providing critical early-stage funding and sector-specific business expertise. Now in its 13th year, the PALSG continues to be effective in stimulating economic growth and job creation. Through June 30, 2015, the Initiative has created 3,805 jobs, funded 210 projects, and helped to leverage an additional $124.3 million in funds from outside investors.

Pennsylvania is also the beneficiary of significant funding to spur our research and development efforts. In 2015, institutions in Pennsylvania received $1.5 billion from NIH, which was awarded to 3,365 projects, with the average award totaling more than $15 million.

To demonstrate the depth and breadth of these investors and the companies they grow, several technology and life sciences organizations in Pennsylvania recently announced the launch of an interactive Life Sciences Ecosystem Map. A first-of-its-kind database, the map highlights the diversity and scope of life sciences companies doing business in Pennsylvania. From therapeutic and digital health to incubators and research institutions, the map is a resource for both existing life sciences companies and those looking to locate here.

Life Sciences in PA

Patents & Rank

2011-2015

Drug, Bio-Affecting & Body Treating Composition
1,854
4th in the US

Molecular Biology & Microbiology
539
4th in the US

Surgery
414
6th in the US

Source: U.S. Patent And Trademark Office

Employment & Rank

By number of employees. September 2015

Pharmaceutical & Medicine Manufacturing
17,767

Medical Equipment & Supplies Manufacturing
13,068

both 6th in the US

Testing Laboratories
9,095

Analytical Laboratory Instrument Manufacturing
1,290

both 4th in the US

Electromedical Apparatus Manufacturing
3,198

5th in the US

Source: Quarterly Census of Employment and Wages - Bureau of Labor Statistics

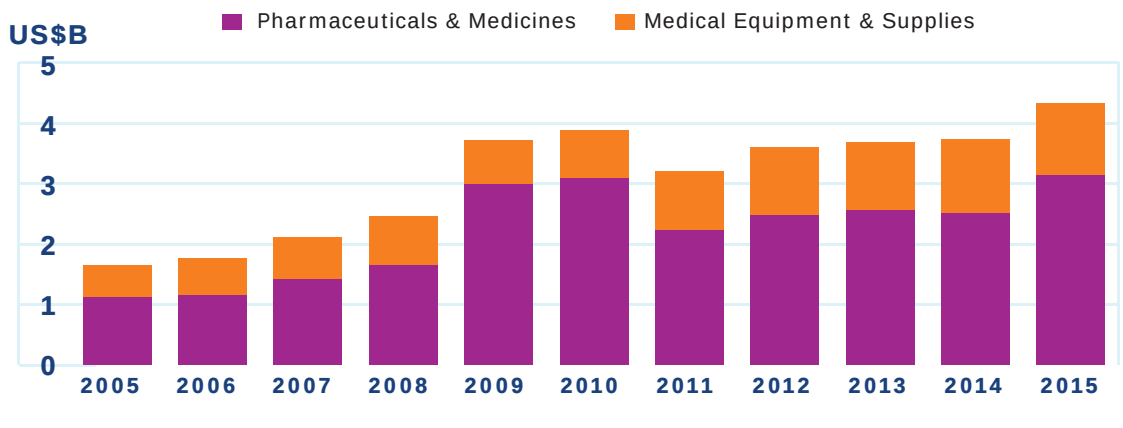
Top Life Sciences Projects

Since 2013

Company	City	Type	Investment in US$M	Employment
Spark Therapeutics	Philadelphia	HQ	50	50
PhotoMedex, Inc.	Horsham	HQ	43	113
Eurofins Lancaster Laboratories, Inc.	Lancaster	R&D	40	300
Cook MyoSite Incorporated	O'Hara Township	HQ	26	64
Adaptimmune Therapeutics plc	Philadelphia	HQ, R&D	25	N/A

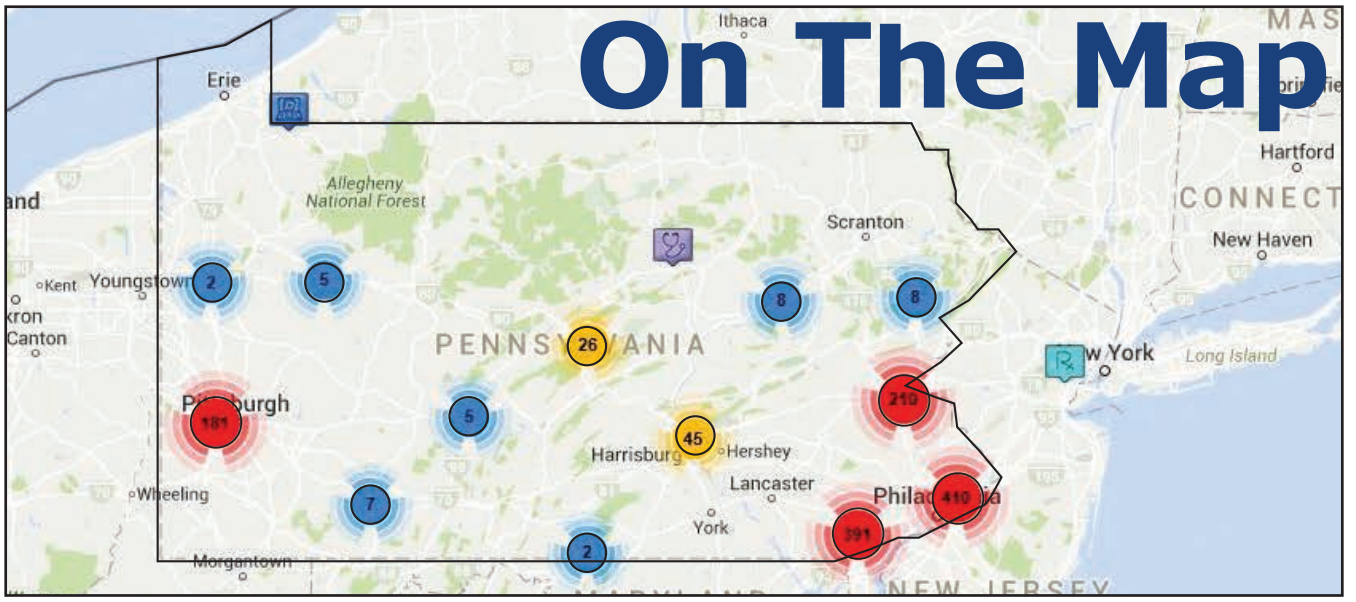
Source: Source: Foreign Trade Division, U.S. Census Bureau.

Pennsylvania Exports



Source: Foreign Trade Division, U.S. Census Bureau

Putting Life Sciences On The Map



A new interactive map shows the scale of Pennsylvania's life sciences community.

by MARY WELCH

Did you know that Pennsylvania has more than 2,300 life sciences companies that directly employ more than 78,000 people?

Well, don't feel alone if you didn't. In fact, Pennsylvania's life sciences community felt it was time to get the word out and formed the Life Sciences Leadership Advisory Council. The council is designed to help promote and grow the industry, including forming the state's first Life Sciences Ecosystem Map, which places all of the life sciences companies literally on the map.

"We, as a trade association for the industry, recognized that other states were developing long-range strategic plans to grow the life sciences segment in their states," says Christopher P. Molineaux, president and CEO of Pennsylvania Bio. "We decided we needed to position Pennsylvania as the hub of life sciences in the United States, and building awareness was the first step."

One of the initial steps was to get a handle on the community. Pennsylvania is large and has four life sciences hubs: Philadelphia, the middle of the state near Penn State University, Lehigh Valley, and the western part centered on Pittsburgh. Ten companies compiled the data for the map, which was funded by BioAdvance, a Philadelphia-based early stage investor.

The map, which will be updated frequently to reflect new companies, is invaluable for companies seeking to locate their biotech businesses, as well as those looking for research facilities or partnerships, Molineaux says.

"This map really shows the economic impact of the life sciences community and how significant the industry is. For instance, a lot of people may not know the University of Pennsylvania is second in R&D funding from the National Institutes of Health, with the University of Pittsburgh seventh," says Molineaux. "We have all this talent coming out of our universities and populating the large pharmas or startups."

The map has already been a tremendous tool with site selection executives and other economic development delegates. "We just had a group from Germany, and I think folks are surprised and impressed at the presence and scale of the life sciences community," Molineaux says. "It's a very dynamic map and a very dynamic community. We haven't spent enough time talking about it, and we're now creating that buzz."

A Partner for Growth

On average, Pitt annually brings $3.7 billion in total economic impact to the state, supporting almost 28,000 jobs. Beyond this, Pitt is the starting point for new companies, with more than 100 start-up companies launched based on Pitt innovations. And Pitt programs have helped local companies gain more than $300 million in new funding.

University of Pittsburgh

When Economic Development Is a Science

uCity Square
Image courtesy of Science Center/Wexford

by RON STARNER

A vision that began 53 years ago has blossomed into a science-based economic juggernaut whose impact is being felt all over Pennsylvania and around the world.

It's called the University City Science Center in Philadelphia, the first and largest urban research park in the nation, and it is changing lives for the better as it pumps billions of new dollars into the Pennsylvania economy.

On June 2, 2015, the Science Center announced a partnership with Wexford Science & Technology, a BioMed Realty company, to double the size of the Science Center's campus. The partnership will help the Center develop nearly 4 million sq. ft. of office, laboratory, residential, retail, and parking space over the next 10 years.

Christopher Laing, vice president of science and technology for the University City Science Center, says that the center has risen to prominence largely due to the unique business model that established it in 1963.

"We are a nonprofit organization that was established as a shareholder-owned organization," he says. "Multiple universities

and research institutions in the Greater Philadelphia area are the shareholders."

That list includes such luminaries as Drexel University, University of Pennsylvania, the Children's Hospital of Philadelphia, and many other colleges and research institutes.

"We were established as an economic development organization," Laing says. "An urban renewal project was part of the original plan. University City was actually a blighted area in 1963. It was an old industrial area where industry had moved out. The goal was to create an engine for urban renewal by working closely with universities to commercialize ideas from the lab. Real estate development and programmatic initiatives were part of the plan."

events. Quorum will be a significant part of our vision for the expanded campus."

Laing notes that by 2017-2018, Quorum could triple in size.

"Our second major initiative is workforce development," he says. "We focus on fostering STEM education plus the arts. We focus on middle school kids and their educators. Groundbreaking programs engage kids in STEM or STEAM programs. This group has been recognized nationally by the White House for its work."

Laing says that one priority of this program is to see more local people employed by the companies being created at University City.

"We are looking into how to engage the local

"We are looking into how to engage the local community in employment opportunities created by the new companies being created here at the Science Center."

— Christopher Laing, *Vice President of Science and Technology, University City Science Center, Philadelphia*

Fast-forward 53 years, and it's safe to say the dream has been realized.

From a meager start of one building on 17 acres in 1963, the campus has grown to 15 buildings on the campus with 2.5 million sq. ft. of space built out today.

"We completed a relationship with a property developer who specializes in biomedical research parks to expand into another 10 acres, so today the entire campus is around 27 acres," Laing adds. "This is a very significant time for the Science Center. This is the first time we have changed the boundaries of the campus. We have re-envisioned the neighborhood under the name 'The uCity Square.' "

Three programs highlight the work the Science Center is doing: Quorum, workforce development, and commercialization.

"Quorum is a community engagement program housed at 3711 Market Street, our headquarters," says Laing. "It convenes a community of entrepreneurs, inventors, innovators, and investors. We hold networking events, seminars, meet-ups. It opened in 2011. Since then, Quorum has hosted more than 800

community in employment opportunities created by the new companies being created here at the Science Center," Laing says. "We are very committed to that. As the companies are maturing and being attracted to the area, we want those job opportunities to be available to the people in the neighborhood.

Under the third initiative — commercialization — Laing says the goal is to strategically direct resources to pre-company projects and companies. "We run business incubation programs and help create new companies," he says.

The Science Center offers the QED program, a multi-institutional proof-of-concept program that provides business development support for academic researchers developing early-stage life sciences and healthcare-IT technologies with high commercial potential.

Over the course of more than half a century, the Science Center has produced more than a few success stories of note. Perhaps the most famous corporate graduate is Centocor, which today is owned by Johnson & Johnson and does business as Janssen Biotech.

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Director, Real Estate Development
Facilities and Real Estate Services
University of Pennsylvania
sehnert@upenn.edu

Photo courtesy of David Lamb Photography

A life sciences company thrives on land with a legacy.

Historic Beginnings

by TOM LELAND

Almac, a Northern Ireland-based pharma company with its U.S. headquarters in Montgomery County, was named after the late Sir Allen McClay, a businessman and philanthropist. The "Sir" comes from being knighted by Prince Charles in 2000 for his contributions to the pharmaceutical industry in Northern Ireland.

In 2007 Sir Allen sat down over a cup of tea with the owner of a Souderton dairy farm, with the hopes of persuading him to sell his land for a new Almac facility. The owner didn't relish the idea of a corporate entity sitting on beautiful land, which had been in his family since 1778, where George Washington once camped with his troops, and that had ties to William Penn.

But he liked Sir Allen. More importantly, he liked the ideals that Almac stood for — the potential to help not just the local community, but to advance human health around the world.

Since then The Almac Group has grown from a small staff to approximately 1,100 people employed at headquarters, with another 100 or so at two other Pennsylvania facilities.

Almac provides an extensive range of integrated services to over 600 companies globally within the pharmaceutical and biotech sectors. The services range from R&D, biomarker discovery and development, API manufacture, formulation development, clinical trial supply, and IXRS technology (IVRS/IWRS) through to commercial-scale manufacture.

"The majority of our business is assisting companies with clinical trials," says Mark Weir, U.S. Group financial controller. "We're not a clinical facility — we make, package, and distribute the drugs. We research drug compounds, their stability, the interactions between new compounds and other drugs, how the body handles it.

"Almac has found its niche. Small companies don't have the capital for high-tech labs, so they outsource to us," says Weir. "The big pharma players do of course, but as public companies their motives are often driven by forces that we're not susceptible to.

"Sir Allen set it up so that Almac is owned by a charitable trust," says Weir. "Our customers know that we reinvest our profits, we're not beholden to markets, and we control our own destiny."

Whether your company is seeking business-to-business connections, facing workforce challenges, looking for a property to accommodate expansion or requires assistance navigating state or local approvals, contact us. We're just a call or click away.

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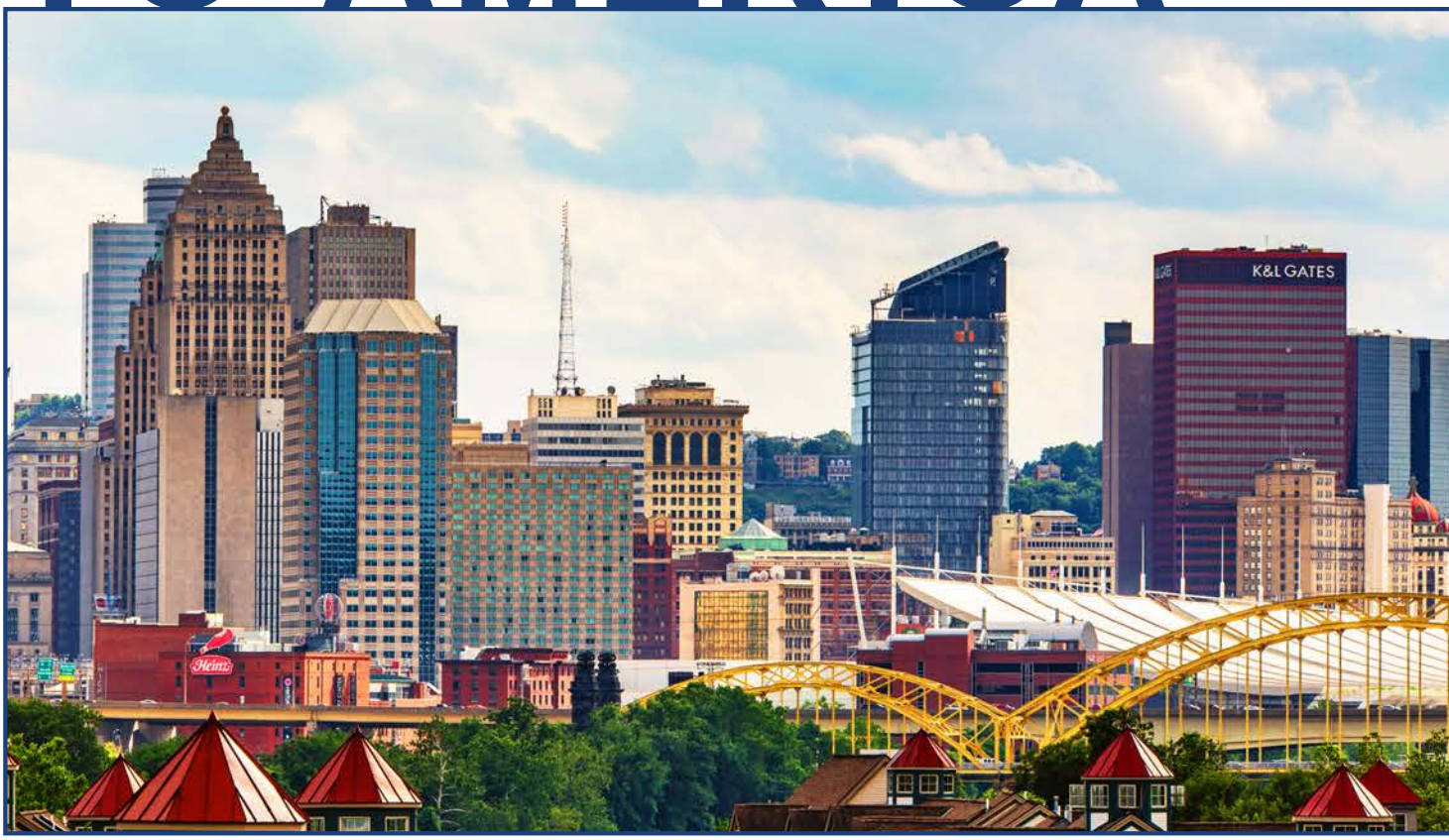
GATEWAY TO AMERICA

by RON STARNER



A French medical device firm taps Pittsburgh for its North American headquarters.

When MG Development, a French manufacturer of hearing aid cleaning products, went looking for a place to locate its North American headquarters, Pennsylvania made sense for all the right reasons, a top company executive says.

"We are very successful in France, and we wanted to come to the U.S.," says C.J. Loeffler, director of sales for MG Development. The company chose Pittsburgh in November of 2015 for its regional headquarters and the place to land 50 new jobs.

Supported in the move by the Pennsylvania Office of International Business Development, MG plans to serve the U.S., Canada, and South America from its new base in Western Pennsylvania.

In an in-depth interview with Pennsylvania Economic Quarterly, Loeffler, who worked at Google and Microsoft before joining MG, shares important details on the site selection process and discusses the location factors that sealed the deal.

Photo courtesy of Allegheny Conference/Dave DiCello, photographer

MG Development is located in an old warehouse and garment district in downtown Pittsburgh that is rapidly being filled with new high-tech companies.

What were the most important site selection criteria that led MG Development to choose Pittsburgh for the company's North American headquarters?

LOEFFLER: One of our first customers was here in Pittsburgh. We do a lot of other international business as well, and Pennsylvania has an international business development office in Pittsburgh. They helped us out. One reason we liked Pittsburgh was because it has the least amount of time zone difference between here and our office in Europe. That minimizes the gap in communications.

When you were conducting your site search, which other potential locations did you consider in North America? How long did the site search take?

LOEFFLER: We actually looked at New Jersey because of shipping reasons. We have a huge headquarters in France. A lot of our stuff is bottled there. We had to have all of our stuff sent from there to over here. Freight is very pricey. We wanted something close to the water. The entire site selection process took two to three months.

> **"We are able to work all over the U.S. from here. You can build a rapport here with your customers very easily. People work hard for their money here."**
>
> — C.J. Loeffler, *Director of Sales, MG Development*

What ultimately gave Western Pennsylvania the decisive edge in the site selection process?

LOEFFLER: Having one of our first customers here. The Allegheny Conference on Community Development was very helpful. They talked about starting businesses here. They talked about the benefits of doing business here.

How does the Pittsburgh location enable your company to also serve the Canadian and South American markets?

LOEFFLER: We definitely use it to serve those markets. We ship from Pittsburgh to Europe, South America, Canada, and Mexico.

What is your overall assessment of the business climate of Pennsylvania right now?

LOEFFLER: Our business is a little bit different. Our actual location does not help or hinder our business. But it definitely helps me because I travel to a lot of medical device conventions. I am on the road all year long. You can go pretty much anywhere from here. We are able to work all over the U.S. from here. You can build a rapport here with your customers very easily. People work hard for their money here.

Can you share any details on the corporate facility project in Pittsburgh?

LOEFFLER: We are ramping up to have 25 to 35 employees. We are looking to grow — with sales people, assembly people, admin people, etc. We are right downtown. We are in the Strip District. It is the old garment warehouse district and location for furniture and meats, etc. It is very cultural. You can get fresh food here. There are Italian places, bars, and restaurants. Many old warehouses have been converted into apartments.

What do you like best about the workforce of Western Pennsylvania?

LOEFFLER: The Pittsburgh person is known as a hard worker. People are dedicated and down-to-earth. They are very work-oriented here.

How important to you is access to talent coming out of the region's many colleges and universities?

LOEFFLER: It will eventually come in handy — especially with places like CMU, Pitt, Duquesne, etc. That is a huge opportunity for us.

Keystone State Is For Real

Corporate office of B. Braun in Bethlehem
Photo courtesy of B. Braun Medical Inc.

Crucial elements for humankind's health prosper in this part of Pennsylvania.

by TOM LELAND

As a world leader in pain management and the 12th largest global medical device manufacturer, B. Braun sought out a location to meet their needs and landed on Bethlehem in the Lehigh Valley.

B. Braun, a 140-year-old German family company, first came to Pennsylvania in the mid-1970s when it purchased a struggling medical device company owned by National Cash Register for $6 million. Since then, B. Braun has grown to the tune of $1.5 billion in revenue and 5,000 American employees.

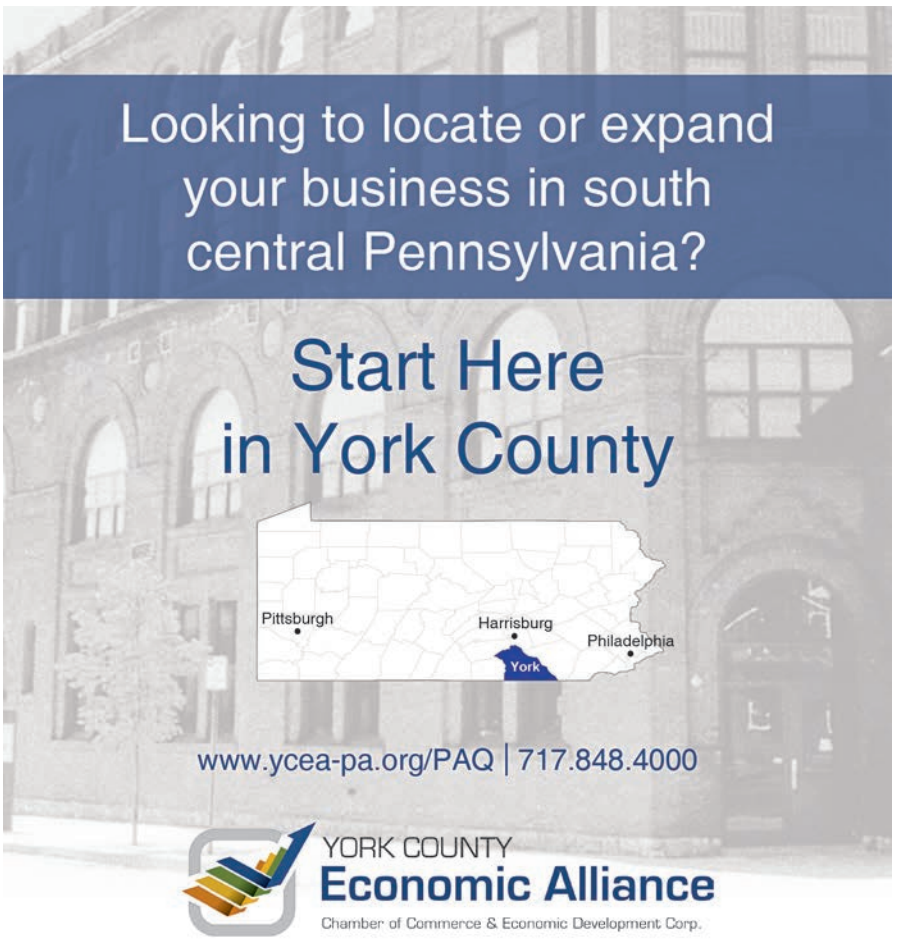
B. Braun is one of the top 100 largest private companies worldwide, the 37th-largest German firm in the U.S., and a leading employer in the Lehigh Valley.

"There is a very skilled workforce here — this is a strong location for people in the medical industry," says Bruce Heugel, senior VP and CFO for B. Braun U.S. "Ultimately, the success of an operation depends on its people — and we have great professionals at B. Braun, in part because in the Lehigh Valley we have the ability to attract and retain high quality, world-class people."

Small wonder the workforce is so qualified, and ideal for a life science/biotech firm, since the Lehigh Valley is close to the nation's financial center, offers vast technological resources, and features access to important research centers and global transportation, government-funded programs and initiatives, and prominent advocacy groups.

"There is a very skilled workforce here — this is a strong location for people in the medical industry."

— Bruce Heugel, *Senior VP and CFO, B. Braun*



Back to that point Heugel makes about proximity. From Reading up to the Poconos, over to New Jersey and down to Delaware is indeed a bio-corridor of sorts.

"We closed down 26 warehouses throughout the country and put one massive warehouse right here in the Lehigh Valley," Heugel says. "Why? Because we can drive to 60 percent of our customers in one day. We also have great success thanks to our transportation, due to the airports and due to the highway system."

"Then, in addition to an excellent location, we have good schools, which serve as a feeder system into our industry," says Heugel. "It comes down to efficiency, it comes down to the economics of a location. We have an abundance of water, we have an abundance of natural gas. Few states can make the same claim."

What kind of success stories have this idyllic location and workforce led to? One recent example is B. Braun's launch of Ster-ASSIST, the first and only comprehensive sterile IV kit supporting ultrasound, which reduces the risk of contamination by maintaining the integrity of a sterile field.

It seems this corner of the world is destined to always be at the forefront of fulfilling whatever the world needs.

Leading the Pack

by MARY WELCH

Pittsburgh-based Cook MyoSite is in Phase III trials on the road to commercialization, and is leading the small but growing cluster of biopharmaceutical, medical device, diagnostics, and life sciences companies forming around Western Pennsylvania.

"The details are a bit fuzzy, but thinking back 16 years or so when we started our research at the University of Pittsburgh, the university didn't have as many resources available as it does today," says Dr. Ron Jankowski, director of research and product development. "They've greatly expanded their resources and ability to support companies like ours."

In fact, the area's resources have developed to the point that when Cook MyoSite needed to expand, the Bloomington, Indiana-based company decided to stay in the area. "The people here were eager to keep roots in Pennsylvania and ties to the University of Pittsburgh. It just made sense to build our company here," says Ryan Pruchnic, director of operations.

Cook MyoSite was created to guide the development and commercialization of technology related to the collection, selection, and expansion of human skeletal muscle cells for the treatment of a variety of disorders. It has three technologies in clinical trials, including one in Phase III for the treatment of patients with stress urinary incontinence who have not responded to other treatments.

As the company moves toward commercialization, it is doubling the number of employees to 130 and moving into a new 65,000-sq.-ft. facility.

"Pittsburgh is certainly less blue collar and filling up with more technology advanced companies. We have the university and Carnegie Mellon here, which certainly helps," says Pruchnic.

And while the area isn't a hotbed of venture capital activity, there is a lot going on with smaller companies, he says. "They just don't make the headlines."

Pittsburgh is no longer the "dirty steel town," and boasts a growing foodie scene as well as world-class sports, arts, and educational offerings, he says. "We have a great pipeline to the university. Pittsburgh has steady growth. It's a town where you want to put down roots, raise families, and bring companies like ours for commercialization and growth."

BREAKING DOWN BARRIERS

Scientists at The Huck Institutes solve problems by working together.

by CAROL CARTER

Penn State's Millennium Science Complex on the University Park campus, designed by architect Rafael Vinoly, is home to The Huck Institutes of Life Sciences and Materials Research Institute.
2011 archive photo courtesy of Penn State University

"We need to understand everything from proteins to pandemics."

— Peter Hudson, *Director, The Huck Institutes of the Life Sciences*

Suppose you have a handful of nails and you need to put them into a board, but you don't know how to go about getting the nails into the board.

On the other hand, suppose you have a hammer and you think that it could be really useful, but you don't know how exactly.

This hypothetical hammer and nails situation is how Peter Hudson, director of The Huck Institutes of the Life Sciences at Penn State University, explains The Huck Institutes' relationship with its next-door neighbor, the Materials Research Institute.

"Basically, I'm a life scientist. I work on infectious disease," Hudson says. "My community of people tends to find problems all the time. We find that malaria is a problem, we find problems with brains and nerve cells. And there is another community, which is the materials community, and those people develop devices."

These two communities need to get together, Hudson says. "I can go and listen to their talks, and I don't really understand. They say, 'I can do a single graphite molecule device where it can sit in somebody's blood stream or it can control their heart rate.' And I go, 'Wow that is phenomenal. So how are you using it?' And they say, 'Well, we've got a lot of ideas, but we haven't really found the problems.'

"So, let's line up the hammer and nails," Hudson says.

This bringing together of different disciplines is what makes The Huck Institutes unique.

"Most of the challenges we're facing are interdisciplinary," Hudson says. "Whatever you want to do in the biomedical side, you have to be able to understand the whole gamut that goes from genomic to molecular, to the individual's personalized health to community health. We need to understand everything from neurons to neighborhoods, from proteins to pandemics. And this means bringing together teams of people to address issues such as diabetes. It's about understanding the whole process."

To do that, Penn State places experts from multiple disciplines — engineers, life scientists and social scientists — in close proximity so that they can work together.

"If we are going to solve the problems of today and tomorrow, we need teams of people, not just people working in isolation," he says. To cite one simple example, life scientists understand that using bed nets is one effective way to combat malaria, but it's the social scientists who know how to change people's attitudes so that they will actually use bed nets.

In addition to existing on the cutting edge of important research, Hudson and his colleagues offer a great deal to businesses wanting to work with them.

First, they provide access. "So, if you're interested in drug development or personalized medicine, we can put you in touch almost immediately with the centers and the people that are really going to focus on that, and you can become part of an active research group within a very short time," he says.

But, perhaps more importantly, Huck and Penn State have what Hudson describes as "these fantastic intellectual property rights."

> **"If we are going to solve the problems of today and tomorrow, we need teams of people, not just people working in isolation."**
>
> — Peter Hudson, *Director, The Huck Institutes of the Life Sciences*

"We've got a very open-door policy, which doesn't involve groups of lawyers. Basically, the university gives up its intellectual property rights, and it's for the person who's doing the work to negotiate those," he says. "We want to loosen it all up. I think it's revolutionary."

It's very interesting, he says, to see the way people think and present their research. "You do it one way," he says, "and you see engineers and you think, 'Different species.' "

It is fascinating, Hudson says. And, most importantly, it can work — this business of these "different species" working together to solve problems.

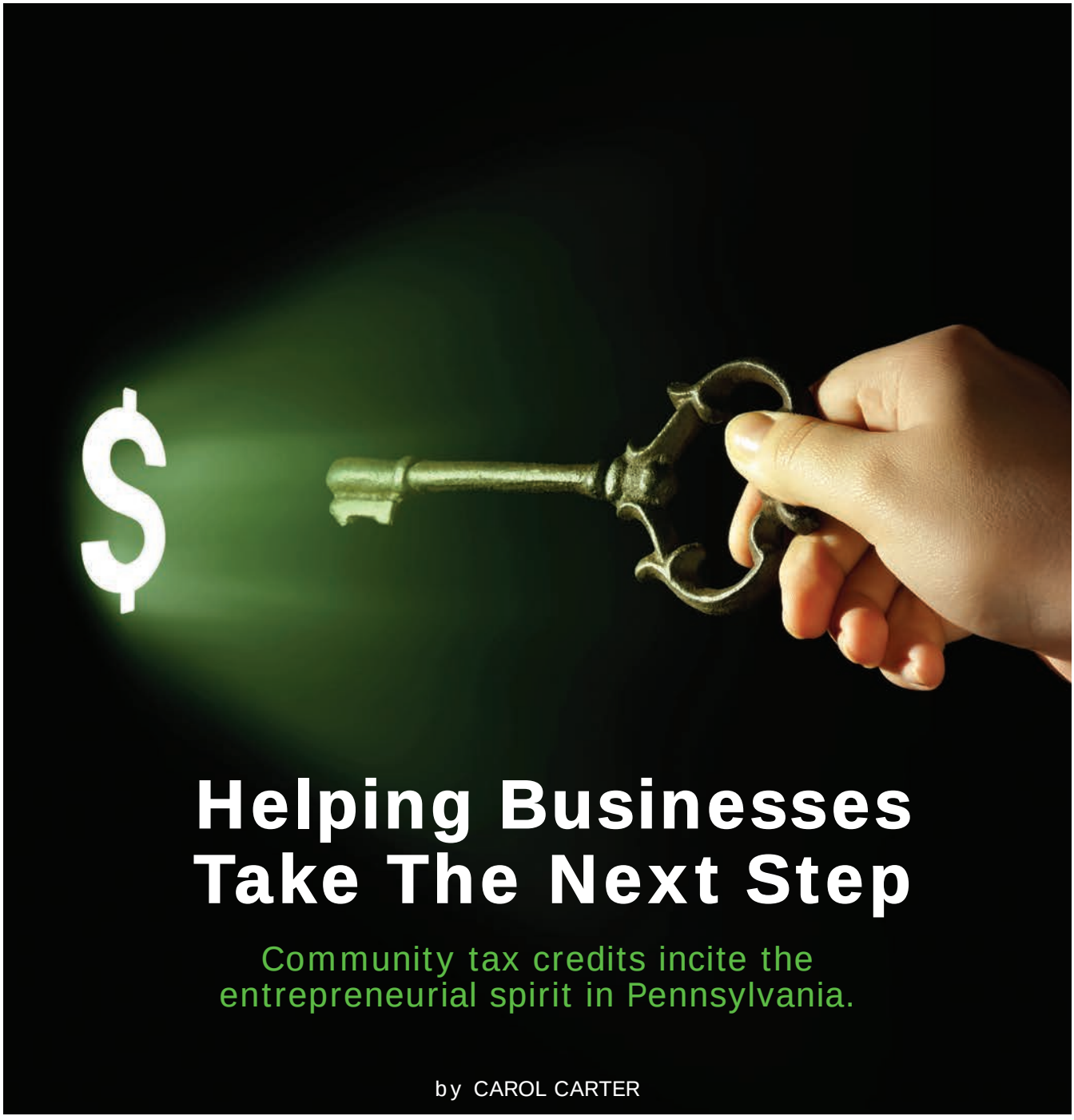


Photo courtesy of Sergey Nivens, iStock.com

Helping Businesses Take The Next Step

Community tax credits incite the entrepreneurial spirit in Pennsylvania.

by CAROL CARTER

You never know what might happen at your children's lacrosse game. Chatting recently with parents in the stands while his daughters played, Chuck Conrad discovered that a couple he knows was about to move their business out of their home and start hiring full-time employees.

Conrad, president of eCedent.com in Indiana, Pennsylvania, told the business owners about the state's Keystone Innovation Zones (KIZ) and the tax credits available to companies located within a KIZ.

Conrad has used the program since 2009. He chose the location for his company because of the bandwidth available in the Indiana County KIZ. Conrad's company enables professionals to manage and certify death certificates online. Since eCedent is an Internet-

"We have been able to secure additional cash every year from the state, so I would have to always say it has helped us move forward positively."

— Chuck Conrad, *President, eCedent.com*

based business, the bandwidth was critical.

Launched as part of an economic stimulus plan, the KIZ program was meant to spur entrepreneurial activity around Pennsylvania's research and development clusters — which is why the KIZs were established around colleges and universities.

"What we ended up with was 29 KIZs across the commonwealth," says Sheri Collins, deputy secretary in the Office of Technology & Innovation at the Pennsylvania Department of Community & Economic Development. Businesses within the zones operate in targeted industry sectors — in life sciences, information technology, advanced manufacturing, energy, and robotics — and are partnered with nearly 100 colleges and universities.

After launching the KIZ program in 2004, Pennsylvania added the tax credit component in 2006.

"To qualify for participation in the KIZ program, and ultimately the tax credit program, you have to be a qualified company in operation less than eight years, and be located in the geographic footprint of a particular KIZ. And you have to operate in one or more of the targeted industry sectors," Collins says. Companies receiving the tax credit also must demonstrate an increase in revenues within a prescribed period of time.

Tax credits must be applied against the tax liability of a KIZ company for the tax year in which the KIZ tax credit is issued. Also, unused tax credits may be applied against the tax liability of the KIZ company for up to five years from the date the tax credit is issued.

These tax credits may be sold to a qualified buyer. In fact, Collins says, qualified businesses often sell their tax credits to other buyers, gaining cash infusions for

their growing companies. They use the cash to hire staff, purchase equipment and pay off debts.

"They may sell them for anywhere between 80 to 97 cents on the dollar," says Collins. "It really is contingent on the company's needs at the time. Most of our companies sell at 93 cents on the dollar."

From the total pool of $25 million in tax credits available annually, a single company can receive up to $100,000 per year. Since the beginning of the KIZ program, 1,518 Pennsylvania businesses have received assistance — just over 239 in 2015. Tax credits awarded over the life of the program total $120.78 million with $17.97 million awarded in 2015.

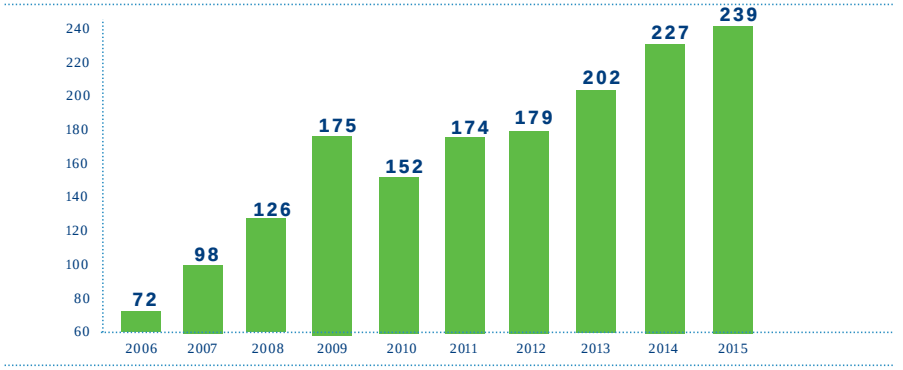
Chuck Conrad admits that he can't honestly say how things would have gone differently for eCedent without the tax credit, but he notes, "We have been able to secure additional cash every year from the state, so I would have to always say it has helped us move forward positively. I truly can't tell you a downside to that."

Importantly for small business owners, Conrad adds that the paperwork doesn't take a whole lot of time.

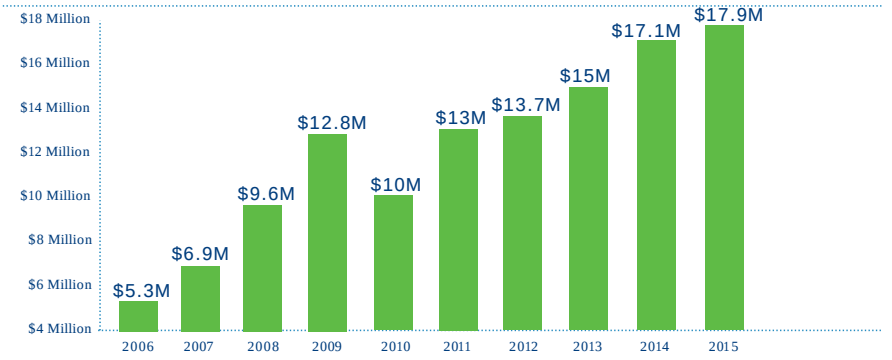
"I think when the program first came out it was a little more difficult, but I think they have really streamlined the paperwork. The first year, the original paperwork takes some time to put together, but it's not that bad, and now yearly, you go in and fill it out, and it's all online and truthfully it doesn't take us that long."

As for his friends at the lacrosse game, Conrad says, "I told them, 'You really need to look into this; it's a wonderful program, and it's not difficult at all to be a part of.' For us, this program truly has been beneficial."

KIZ Companies Awarded KIZ Tax Credits by Year



Amount of KIZ Tax Credits Awarded by Year



Source: Pennsylvania Department of Community & Economic Development

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