INVESTING IN WISCONSIN'S FUTURE

2017 WHITE PAPERS

Improve technology development, delivery and transfer

Improve access to investment capital

Expand the supply of human capital

Enhance the startup and business climate

Produced by

Wisconsin Technology Council

universityresearchpark.org • info@urp.wisc.edu • (608) 441-8000

Where Wisconsin IDEAS Flourish

University Research Park is a neighborhood of ideas, entrepreneurship, and opportunity, positively impacting Wisconsin and beyond.

UNIVERSITY RESEARCH PARK
UNIVERSITY OF WISCONSIN–MADISON

@1403

Talented, innovative community actively engaged in Wisconsin's entrepreneurial movement.

urpat1403.com

merlin MENTORS

A network of highly qualified mentors, working to guide emerging entrepreneurs to business success.

merlinmentors.org

madworks coworking

Professional work environment that fosters a vibrant community of innovative thinkers.

madworkscoworking.org

INVESTING IN WISCONSIN'S FUTURE

2017 WHITE PAPERS

The role of the Tech Council

The Wisconsin Technology Council is the bipartisan, non-profit science and technology policy adviser to the governor and the Legislature, as reaffirmed through Executive Order 51. The Tech Council periodically issues "white papers" and special reports to assist those policymakers.

Tom Still
President

Toni Sikes
Chairwoman

The ideas offered in the Tech Council's 2017 white papers are intended to set the table for a renewed public discussion about improving the state's tech-based economy.

They include emerging priorities as well as restatements and updates from previous white papers, legislative proposals or executive branch proposals. Some are based on our knowledge of innovative ideas in other states.

Most ideas are brought forward by our board members, members of our Tech Council Innovation Network and others – entrepreneurs, investors, service experts and researchers -- who attend our events and seminars.

Our ideas often draw upon our understanding of Wisconsin's tech-based economy's strengths and weaknesses as compared to other states. We advocate a comprehensive look, not a focus on any single metric. The "Tech Metrics" section in this report quantifies how Wisconsin ranks among those states according to nearly two-dozen measures that deserve the attention of all policymakers.

Some might suggest bold ideas won't fly in Wisconsin for political or budgetary reasons. Our own history suggests otherwise. State policymakers have carefully considered ideas recommended in past white paper reports and embraced many.

We are pleased to offer our 2017 white papers report to you, and invite you to read on to learn more about the depth and breadth of Wisconsin's tech-based economy.

Contents

Executive summary 2
How past white papers have helped 4
Section 1/ Improve access to investment capital 6
Section 2/ Enhance the startup and business climate 8
Section 3/ Expand the supply of human capital 12
Section 4/ Improve technology development, delivery and transfer 14
Interdisciplinary Technology Clusters 15
Tech metrics 18

Executive summary

Recommendations in the Wisconsin Technology Council's 2017 white papers report fall into four major categories:

Improve access to investment capital

Enhance the startup and business climate

Expand the supply of human capital

Improve technology development, delivery and transfer

Within those four broad categories, here are our leading recommendations to the governor and Legislature:

- **Raise the $8 million cap on credit-eligible investments for Act 255 firms to $12 million**, which will help existing, state-based companies poised for growth.
- **End tax on capital raised by C corps deemed "foreign corporations,"** making sure changes are targeted to firms of a certain size, age and other factors.
- **Accelerate investments, where possible, in broadband deployment.** This can be done by leveraging federal Connect America Fund 2 and similar grants in Wisconsin with state support.
- **Make it easier to succeed as an entrepreneur in Wisconsin.** Barriers to success may include employment non-compete agreements; certain professional and occupational licensing requirements; local or state rules that "fence in" older economic models; and a lack of flexibility regarding new types of corporate structures.
- **Re-invest in higher education.** This was a core recommendation in the Tech Council's spring 2016 report, "The Value of Higher Education to Wisconsin's Economy."
- **Invest in emerging clusters unique to Wisconsin**, which are often tied to regional or industry sector strengths. Some of these clusters were first identified in the Tech Council's 2003 report, "Vision 2020: A Model Wisconsin Economy."

The art of the deal: Wisconsin Early Stage Symposium 2014. Photo: Bob Modersohn

Related ideas for state policymakers and others:

- Rethink non-compete agreements.
- First, do no harm: Avoid state restrictions on research.
- Create a state-leveraged "Grameen Bank" micro-loan program.
- Create a WEDC "Welcome Wagon" for companies that acquire, merge or establish strategic partnerships with young companies in Wisconsin.
- Increase prize support for the Governor's Business Plan Contest.
- Raise the Act 255 credit from 25 percent to 40 percent for the first $1 million in eligible investments.
- Eliminate state capital-gains taxes on investments held three years or longer in a Wisconsin business.
- Re-examine professional and occupational licensing.
- Enhance access to out-of-state power.
- Embrace innovation in transportation.
- Get behind appropriate local efforts to compete for major grants, private and public.
- Monitor best practices by leading "think tank" organizations that chart the entrepreneurial and tech-based economy.
- Consideration of a "benefit corporation" status for Wisconsin.

Federal policy recommendations

In addition to recommendations to state policymakers, the Tech Council encourages Wisconsin's congressional delegation to consider the following ideas or proposals:

- Keep the existing "accredited investor" threshold currently being reviewed by the Securities and Exchange Commission (individual income exceeding $200,000 or joint income with a spouse exceeding $300,000 and/or $1 million net worth).
- Support the HALOS Act, or "Helping Angels Lead Our Startups Act," which provides clearer definition of what constitutes "general solicitation" and clearly exempting demo fairs, pitch conferences and angel group presentations.
- Create a federal tax credit, similar to Wisconsin's Act 255 tax credit program that would incentivize investing in technology startups.
- Create new visas for U.S.-educated students and entrepreneurs through legislation such as the "Immigration and Innovation ("I-Squared") Act, introduced by U.S. Sen. Orrin Hatch, R-Utah.
- Eliminate artificial per-country caps for employment based immigrant visas.
- Ensure that Wisconsin's interests in trade and foreign direct investment are protected, with or without bilateral trade agreements.
- Support the work of the bipartisan "Developing and Growing the Internet of Things" study committee.
- Work to reduce cybersecurity threats, external and otherwise.

To read past white papers and other policy reports, visit our web site at **www.wisconsintechnologycouncil.com**.

How past editions of our 'White Papers' have helped

The Wisconsin Technology Council is the bipartisan, non-profit science and technology policy advisor to the governor and Legislature. It also informs other arms of state and federal government, as well as business leaders themselves, about ideas and trends that propel the state's tech-based economy.

Since its creation in 2001, the Tech Council's policy reports, recommendations and general advocacy have laid the foundation for more than a dozen initiatives, including:

- Passage of the Badger "Fund-of-Funds" in 2013. This $25 million investment by the state will be matched by private dollars on a 2-to-1 basis as the venture capital fund creates more recipient funds.
- Passage of the Act 255 investor tax credits (2004) and revisions to the nationally recognized program (2009 and 2013).
- Creation of the Wisconsin Angel Network, which has expanded from five networks and angel groups in early 2005 to two-dozen early stage groups today.
- Expansion of the scope of allowable bonding projects for the Wisconsin Health and Educational Facilities Authority.
- Repeal of the shareholder wage lien law, which discouraged investment in Wisconsin startup companies.
- Improvements in laws governing entrepreneurial activity by University of Wisconsin faculty.
- Improvements in processes and regulations vital to expanding broadband availability, especially in rural Wisconsin.
- Extension of the "single-sales factor" sales apportionment for corporate income to technology and service firms in Wisconsin.
- Enactment of an Education Tax Credit to assist employers in hiring and training workers.
- Support for the "Emerging Technology Centers" concept within the UW System, which was first envisioned as Centers of Excellence in the Tech Council's Vision 2020 report.
- Support for an Interdisciplinary Research Center, also through Vision 2020, which was consistent with the Wisconsin Institutes for Discovery and Morgridge Institute for Research, which opened in December 2010.
- Broader recognition of the economic value of academic research and development in Wisconsin, which attracts nearly $1.3 billion in sponsored research each year.
- Creation of the I-Q Corridor branding concept and support for multi-state relationships.
- Passage of AB-729 in 2014, which allows the UW System to pursue classified research projects through a mechanism that allows for faculty governance with regular reporting to the Legislature.
- Extension of funding for the WiSys Technology Foundation, which assists UW System campuses in transferring technology to the marketplace.

Wisconsin Economic Development Corporation

Wisconsin Technology Council

TECH COUNCIL INVESTOR NETWORKS
IGNITING EARLY STAGE INVESTMENT

TECH COUNCIL INNOVATION NETWORK

WISCONSIN Tech Summit

WISCONSIN GOVERNOR'S BPC BUSINESS PLAN CONTEST

WISCONSIN ENTREPRENEURS' CONFERENCE

Wisconsin YES! www.WisconsinYES.com

Wisconsin Early Stage Symposium

Improve access to investment capital

Raise the $8 million "lifetime" cap on credit-eligible investments for Act 255 firms, unchanged for nearly a decade, to $12 million. Many Wisconsin early-stage companies, especially in the life sciences and advanced manufacturing sectors, would benefit from the ability to offer investors additional tax credits for future funding rounds. These later-stage funds can be difficult to raise, but they can be an important link for a company on a path to accelerating job growth.

End tax on capital raised by C corps deemed "foreign corporations" making sure changes are targeted to firms of a certain size, age and other factors. A proposal to tie this to Qualified New Business Venture companies has been presented to the state Department of Financial Institutions. Most startup companies in Wisconsin are – or should be if they expect to get professional financing – C corporations. Most of them, if they expect to get professional money, are incorporated in Delaware. The reasons for this are many – and emerging companies in most states do the same thing. At issue is a provision in the tax code/DFI regulations whereby these companies are considered "foreign corporations" because they are registered out of state and they owe taxes on the money they raise in a financing round. This is a major issue in that investors do not want their money going to pay taxes. It is one thing to pay taxes on earned income, but investment dollars are hard to come by. Besides, these companies are doing business and headquartered in Wisconsin; their staffs are in Wisconsin and most if not all the investment dollars are spent in Wisconsin.

Create a state-leveraged "Grameen Bank" micro-loan program to spur small business development in Milwaukee's North Side and other inner-city neighborhoods that meet certain business startup and unemployment metrics. The model for this may look like the "Badger Fund of Funds," which is a state investment matched by private dollars. http://www.grameenamerica.org/

Raise the Act 255 credit from 25 percent to 40 percent for the first $1 million in eligible investments. The first $1 million of financing is often the most difficult raise for an early stage company. It is often most risky for investors, as many companies are just starting out and have little or no revenue. Raising the Act 255 credit to 40 percent for just this stage of a company's fundraising process would encourage the state's active angel community to back companies earlier. As an alternative to specifying a percentage or dollar amount, the Tech Council recommends that WEDC implement credit changes that fit within expected budget limits.

Eliminate state capital-gains taxes on investments held three years or longer in a Wisconsin business. There have been proposals in recent years to completely eliminate state capital-gains taxes on long-term gains (held a minimum of five years) in Wisconsin businesses. Many investors have said three years would be more attractive, given the nature of software and other IT investments. Wisconsin currently is middle of the pack among the 50 states in taxing capital gains. Until 2009, however, Wisconsin taxed them at a maximum of just 2.7 percent. That rate was among the dozen lowest in the nation, including the seven states that don't tax income at all, whether it's from wages or stock sales. A phased-in approach to reducing capital gains on privately held companies on the primary issuance of shares would enhance investment in high-growth companies.

Top Priority

networking matters.

At AT&T, we know that making connections is critical to success. In the Wisconsin Technology Council and across the nation, we link businesses with their customers and the world through our wireless network with access to the nation's largest Wi-fi network. It's just another way we help our customers stay connected.

Enhance the startup & business climate

Accelerate investments, where possible, in broadband deployment. Rural America was thrown a Depression lifeline in the 1930s when the federal government rallied to spread electric power across farm country. Not long after came affordable rural telephone service, even if it was delivered through a black "party line" phone hanging on the kitchen wall.

The modern equivalent is broadband, generally described as high-speed connections to the internet. After lagging in broadband capacity for years, rural Wisconsin may finally be poised to catch up.

The breakthrough is largely a result of the second Connect America Fund, which tasked the Federal Communications Commission to work directly with major providers who promised to deliver high-quality service in underserved – mostly rural – areas.

Only California among the 50 states will receive more federal dollars than Wisconsin between 2016 and 2020 to enhance broadband downloads and uploads in places that are isolated and otherwise underserved. About $570 million will be allotted over six years to three providers – CenturyLink, Frontier and AT&T, in order of competitive grant size – to augment private investments in broadband by those same companies.

About 40 percent of the money must be spent by the end of 2017 and 20 percent per year must be put to work in 2018, 2019 and 2020. The goal is to efficiently bring broadband at a market price to about 230,000 Wisconsin homes that don't have solid access today.

The federal rules lay down minimum download and upload speeds – essentially, how fast a computer receives and sends data – as well as price points for service that must include reasonable data "caps," or limits on monthly use that can force people to ration how much they use the internet.

For the latest CAF program to work, however, communities and governments must collaborate on the technically gritty details of deployment, staging and cost. Some models are emerging, particularly in places such as Vilas County. Also, Gov. Scott Walker has proposed expanding the state's broadband development fund by $35.5 million to speed deployment.

Adequate broadband connections can help stem the loss of rural population and jobs. It can enhance eCommerce for businesses large and small; bolster public safety; improve health through telemedicine; boost tourism by encouraging visitors to stay longer; entice Millennials to stay put and connected; and improve education for kids who otherwise lose their internet connections once they leave the school grounds.

Make it easier to succeed as an entrepreneur in Wisconsin. Barriers to success may include employment non-compete agreements; certain professional and occupational licensing requirements; local or state rules that "fence in" older economic models; and a lack of flexibility regarding new types of corporate structures. Four elements of this include:

- **Rethink non-compete agreements.** Most entrepreneurs have prior industry experience they can leverage to create or join a new company. Employee non-compete agreements disrupt entrepreneurship by erecting barriers to the free movement of talent.
- **Re-examine professional and occupational licensing.** Nearly one-third of American workers are required to have a government-issued license to do their jobs. Occupational licenses can act as a barrier to entrepreneurs. Revisit such requirements to spur competition and business creation. A proposal by Gov. Scott Walker would require periodic review of such regulations.

Investors discuss the state's venture climate at the 2013 Wisconsin Early Stage Symposium. Photo: Bob Modersohn

- **Help Wisconsin fully participate in the "sharing" economy.** In a number of sectors, companies have become successful in what is known broadly as the "sharing" or peer-to-peer economy. This is a collaborative consumption model in which participants share access to products or services, rather than having individual ownership. These systems take a variety of forms, often leveraging information technology to empower individuals, corporations, non-profits and government with information that enables distribution, sharing and reuse of excess capacity in goods and services. Examples include ride-sharing, accommodations, products, services and more. Wisconsin should provide state-level guidance to ensure that such companies and innovations are not unduly restricted by local regulations that may, in some cases, "fence in" older economic models.
- **Adopt a benefit corporation as a new corporate legal entity in Wisconsin.** At least 30 states, "blue" and "red," have done so in recent years. A benefit corporation is a type of for-profit corporate entity that includes positive impact on society, workers, the community and the environment in addition to profit as its legally defined goals. Benefit corporations differ from traditional C corporations in purpose, accountability, and transparency, but not in taxation. Illinois, Indiana and Minnesota are among states that have adopted B corporations laws.

Enhance access to out-of-state power. This can help control prices, ensure reliability and enhance use of renewable sources. The Tech Council has long supported efforts to increase Wisconsin's access to out-of-state electric power, primarily renewable wind power from the west, as well as the safe, efficient transmission of in-state electric power. This approach is more cost-effective over time than building new generation plants and would continue the state's efforts to reduce reliance on coal-fired plants.

Create a WEDC "Welcome Wagon" for companies that acquire, merge or establish strategic partnerships with young companies in Wisconsin. The goal is to help these companies and their employees acclimate to the state and open doors for other transactions. This is built on the theory that one of the best ways to recruit out-of-state companies is to have them acquire, fund or merge with emerging in-state firms. While WEDC already endeavors to touch companies in many ways, this could become a special mission of a constitutional officer such as the lieutenant governor. Recent examples: NeuWave Medical and Ethicon; Stratatech and Mallinckrodt Pharmaceuticals; Arrowhead Pharmaceuticals (formerly Mirus) and its $45 million private stock offering; Phillips-Medisize and Molex LLC; Redox and Kinvey.

Increase prize support for the Governor's Business Plan Contest. State support for the GBPC has remained at $50,000 per year from its inception, despite a track record that now includes about 325 finalists who have collectively raised $200 million in angel, venture, grants and venture debt over time. Those same finalists have stayed in business much longer than normal when compared to U.S. startup rates – and they are creating jobs and exits. Examples of significant public support for similar contests include 43North in Buffalo, N.Y., which is a $5-million contest; the $3-million Rice University contest; and the $1-million Mass Challenge in Massachusetts. The Tech Council covers the cost of administering the contest and raises private dollars and service prizes.

Monitor best practices by leading "think tank" organizations that chart the entrepreneurial and tech-based economy. Examples include CompTIA-TECNA, State Science and Technology Institute, Angel Capital Association, the National Venture Capital Association, Brookings Institution, the Kauffman Foundation and the Milken Institute. The Tech Council's "Tech Metrics" update in this report captures some of that data.

AMERICAN TRANSMISSION COMPANY®

MOVING ENERGY INTO THE FUTURE

Electricity powers our world.

Each day, light switches are flipped, computers are powered up and factories hum with activity. Electricity enables automation, convenience, productivity and opportunity.

At American Transmission Co., we're hard at work keeping the lights on and planning today for how the electric grid of our future will deliver reliable, affordable and environmentally responsible power.

Read more at **www.atcllc.com/PowerForward**

"At the end of the day, they know where we're coming from."

People who know Startups, know BDO.

The Technology & Life Sciences Practice at BDO

With advisors all over the world, BDO's Technology & Life Sciences practice, along with seasoned private equity professionals, encompass more than traditional audit, tax, risk advisory, and consulting. Combining industry knowledge with experienced, service-driven professionals, we can help you address the diverse business issues affecting the industry.

Accountants and Consultants **www.bdo.com/technology**

BDO

Expand the supply of human capital

Demographics are working against Wisconsin.
Like many states, Wisconsin faces a wave of Baby Boomer retirements – already well under way. Also, birth rates have declined, as reflected in school enrollment figures.

Out-migration of workers (the so-called "brain drain") remains a demographic drag. Recent calculations of U.S. Census data by Governing magazine showed Wisconsin with a negative net migration rate between 2010 and 2015, a period when 16,998 more people moved out than in.

Wisconsin is historically low on the list of states that attract immigrants, who often fill workforce gaps. The state's two largest cities, Milwaukee and Madison, claimed 9.8 percent and 10.7 percent foreign-born populations in 2014. The U.S. average was 13 percent.

Perhaps most telling are figures related to "prime working age" population, which economists peg as people between 25 and 54 years old. The national total climbed 0.6 percent between 2010 and 2015, but fell sharply in Brown, Jefferson, Kenosha, Outagamie, Ozaukee, Racine, Walworth, Washington and Waukesha counties while rising at roughly the U.S. average in Dane and Milwaukee counties. Unless Wisconsin replenishes its workforce breeding stock within 10 years or so, there will be fewer working adults here than there are retirees.

What once was described as a "skills gap" has become a "body gap," requiring a comprehensive approach to workforce development. The Governor's Council on Workforce Investment has been researching challenges and possible solutions. That group's work builds upon the efforts of past workforce commissions, the state Department of Workforce Development and other public and private bodies.

Top Priority

Conversations at 2014 Wisconsin Early Stage Symposium. Photo: Bob Modersohn

Much of the solution revolves on leveraging one of Wisconsin's leading assets – its public higher education systems.

In the spring of 2016, the Tech Council issued "The Value of Higher Education to Wisconsin's Economy." It noted that further cuts in public support for higher education in Wisconsin will harm the state's economy, which relies on colleges and universities for talent, technology transfer and business development in the communities those institutions serve.

Major recommendations are:

- In making funding and programming choices, policymakers should compare UW-Madison with its national peers (top 25 research universities) and UW-Milwaukee with its peers (top 25 urban research universities).
- Examine ways to speed time to graduation, which varies greatly within the UW System. Strategies include improving portability of credits, accelerating programs that help high-school students get a "head start" on college and embracing best practices at Wisconsin's private colleges and universities.
- Support faculty tenure policies developed by the UW Board of Regents and its Tenure Policy study group.
- Improve the efficiency of campus interactions with the business community.
- Encourage the UW Foundation and similar foundations with ties to the UW to investigate "mission investing" as a part of their portfolio management strategies.
- Ensure that "front-door" business portals such as the UW-Madison Office of Corporate Relations exist on each of the four-year campuses.
- Appoint a blue-ribbon commission to consider questions related to UW System general-purpose revenue funding; administrative flexibility; campus consolidation; tuition freezes; supporting a "second" research university; supporting research and technology transfer on non-doctoral campuses and how to get the most out of two-year campuses that make up the separate Wisconsin Technical College System and the UW System's two-year centers.

Read the full report at
www.wisconsintechnologycouncil.com

A significant indicator of Wisconsin's information technology industry is the annual *Cyberstates* report by the TechAmerica Foundation. The latest report, which covered 2012 information, showed:

- Wisconsin is the 20th ranked cyberstate in terms of jobs, with 86,000 tech workers in 52 NAICS codes.
- Wisconsin added 800 jobs between 2011 and 2012, which ranked 20th in the nation.
- Tech workers earned an average wage of $68,400 in 2012, which was 71 percent higher than Wisconsin's average private-sector wage.
- Wisconsin's total tech payroll in 2012 was $5.9 billion, good for 22nd nationally.
- There were 5,400 tech establishments in Wisconsin in 2012, which ranked 23rd nationally.
- Wisconsin ranked 3rd nationally in electromedical equipment with 6,200 jobs.
- The state ranked 9th nationally in electronic components with 7,000 jobs.
- Wisconsin ranked 10th nationally in software publishers with 8,300 jobs.

A separate 2014 report by the TechAmerica Foundation showed Wisconsin's position as an exporter of tech products and services:

- There are 22,300 jobs in Wisconsin supported by tech exports, good for 15th among the states.
- Wisconsin ranked 15th overall among the 50 states in tech exports.
- By sector, Wisconsin ranked 15th in exports of computer equipment, 19th in communications equipment, 24th in audio and video equipment, 22nd in semiconductors and electronic components, 9th in measuring and control equipment and 10th in magnetic and optical equipment.

Improve technology development, delivery and transfer

Invest in emerging clusters unique to Wisconsin, which are often tied to regional or industry sector strengths. Some of these clusters were first identified in the Tech Council's 2003 report, "Vision 2020: A Model Wisconsin Economy." Water and power/controls are two current examples, but there is room for more. Leading examples are regenerative medicine (not broad-based biotechnology, which at least three-dozen states claim as a strength) and advanced transportation – autonomous vehicles, drones, agricultural robotics and the "Internet of Things" as it applies to logistics. This could include a horizontal view of national priorities and certain "grand challenges" in energy, water, air, next-generation computing and transportation.

First, do no harm: Avoid research restrictions. The Tech Council has been on record since 2001 as opposing state-based regulations or laws that put Wisconsin researchers and companies at a competitive disadvantage in terms of tech-based research and development. Please visit www.wisconsintechnologycouncil.com to read about "The Future of Research in Wisconsin."

Get behind appropriate local efforts to compete for major grants, private and public, such as the Smart City Challenge sponsored by the U.S. Department of Transportation and efforts by IBM, Cisco, Google, GE, Siemens, National League of Cities and others. Acting before the die is cast is often important in such competitive situations. It's important to remember that Wisconsin is essentially a state of mid-sized cities, and their "edge" may depend on implementing innovative ideas with the help of partners. A recent example is the Madison community's effort to bring the F-35A fighter jets to Truax Field.

Embrace innovation in transportation. Wisconsin has always been in the driver's seat when it comes to innovation around machines that move on roads, waterways and farm fields. Today, Wisconsin is positioned to take a lead in research, development and testing of self-driving vehicles. A partnership including UW-Madison engineers has been named one of 10 proving grounds for driverless cars and trucks by the U.S. Department of Transportation. It's an opportunity that will only get bigger for states with the right expertise, business mix and policy leadership.

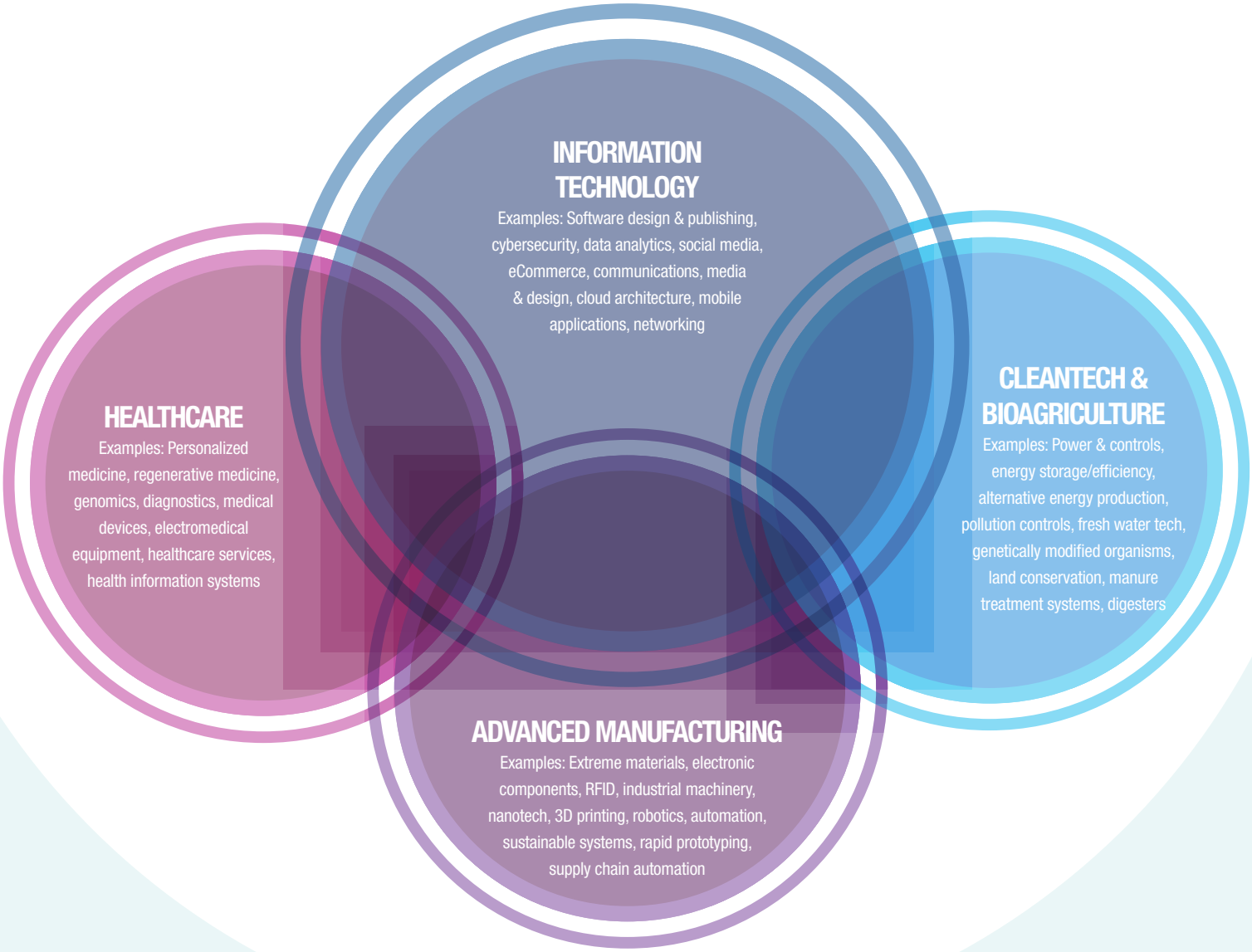
According to the National Conference of State Legislatures, six states have passed legislation related to autonomous vehicles: Nevada, California, Florida, Michigan, North Dakota and Tennessee. Self-driving cars are already a common sight in California, where 11 companies have permits to test such vehicles on the roads. Generally speaking, existing state laws allow self-driving cars with a human operator who can engage of disengage autonomous operation. Wisconsin could stand out if it passed legislation allowing pilot studies of fully autonomous vehicles, which don't require human backups.

Top Priority

WISCONSIN'S INTERDISCIPLINARY TECHNOLOGY CLUSTERS

The model below shows how Wisconsin's top industries connect across different sectors, with information technology increasingly playing a larger role in massive markets such as healthcare, advanced manufacturing and energy technologies.

Many of the recommendations in this publication are ways state policymakers can continue to support existing growth industries while emphasizing the skills, programs and investments needed for future jobs in Wisconsin.



How does Enbridge impact Wisconsin?

Enbridge meets 100 percent of Wisconsin's refinery capacity needs.

Proudly operating in Wisconsin since 1949, Enbridge safely delivers North American energy that is refined here and used here every day—to fuel your vehicle, heat your home and power commerce and manufacturing.

> **Learn more about Enbridge in Wisconsin at Enbridge.com/Wisconsin**

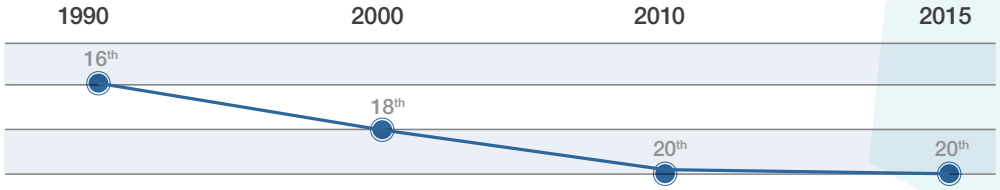
ENBRIDGE
Life Takes Energy™

Tech metrics

The Tech Council gathers or has access to a wide range of data regarding various indicators that measure the progress of the economy. Driving off our past research and metrics established by "Vision 2020: A Model Wisconsin Economy," as well as other sources, we have created a credible source of data in the following areas: investment capital, intellectual property, higher education degrees, patents, research and development grants, SBIR grants, federal R&D dollars, industry R&D dollars, workforce standing, tech-worker jobs and salaries, net new company creation, exports and more. This provides a periodically updated platform for measuring Wisconsin by indicators that truly propel the high-growth economy. All rankings below reflect Wisconsin's standing among the 50 states for the given year.

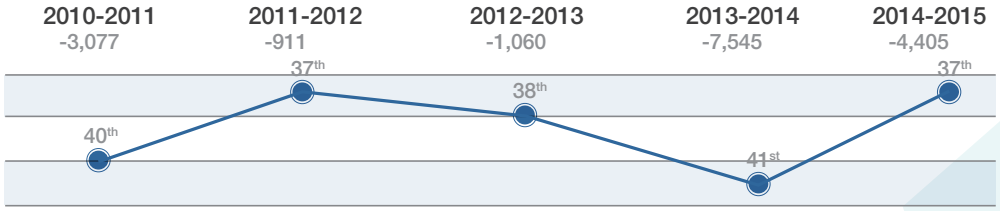
TOTAL POPULATION
5,771,337
(ESTIMATED JULY 1, 2016)

Source: Census.gov



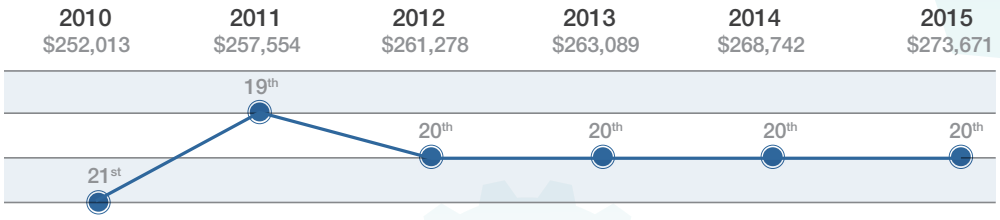
NET MIGRATION

Source: Census.gov



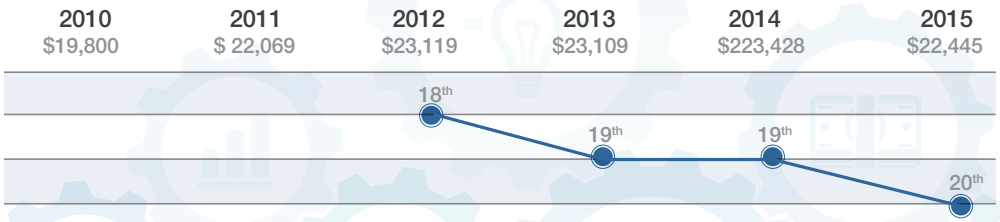
REAL GROSS DOMESTIC PRODUCT
(IN MILLIONS)

Source: Bureau of Economic Analysis



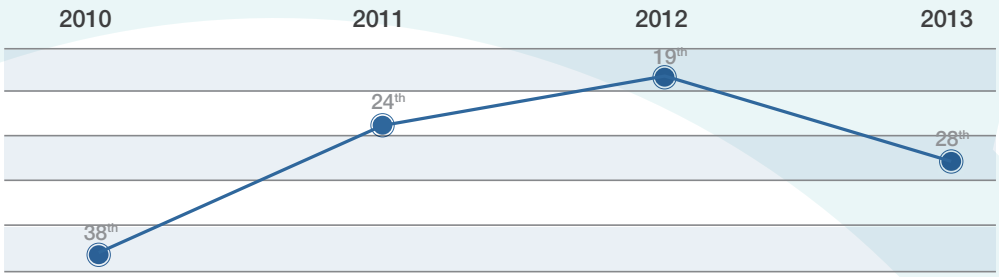
TOTAL EXPORTS
(IN MILLIONS)

Source: Census.gov



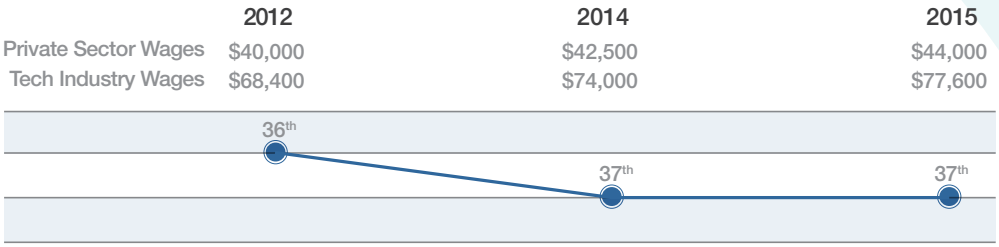
NET FORMATION OF HIGH-TECH ESTABLISHMENTS PER 10,000 BUSINESS ESTABLISHMENTS

Source: Milken Institute



TECH WORKER AVERAGE SALARY VERSUS PRIVATE SECTOR AVERAGE

Source: Cyberstates Report



LEADING TECH INDUSTRY SECTORS BY EMPLOYMENT

Source: Cyberstates Report/Bio.org

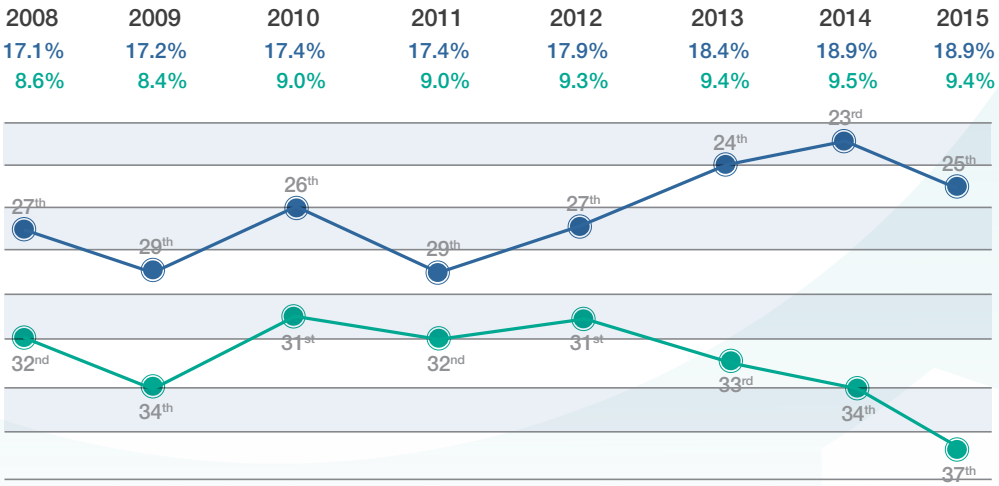
	2010	2011	2012	2013	2014	2015
	20th	20th	20th	20th	20th	20th
IT Services	-	-	-	18,900	19,500	20,900
Engineering Services	-	-	-	11,500	11,600	12,100
Tele-communications	-	-	-	11,800	11,400	12,000
Software Publishing	-	-	-	9,800	11,000	11,800
Internet Services	-	-	-	-	8,700	9,500
Instruments Mfg.	-	-	-	9,600	10,000	-
TOTAL	86,945	90,432	92,469	92,213	93,717	97,602
BioScience	30,796	-	31,758	-	31,687	-

EDUCATIONAL ATTAINMENT AS A PERCENTAGE OF POPULATION AGE 25+

Source: Census.gov

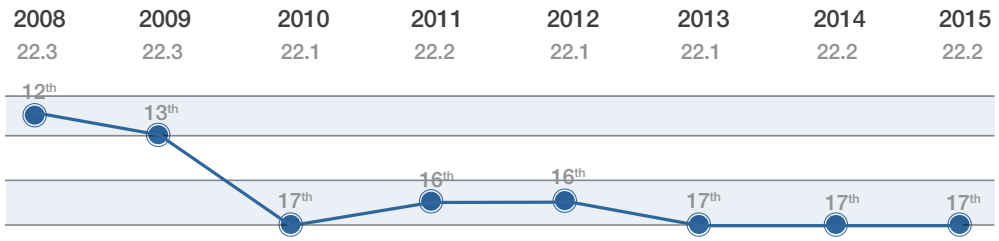
Bachelor's Degree or Higher

Advanced Degrees



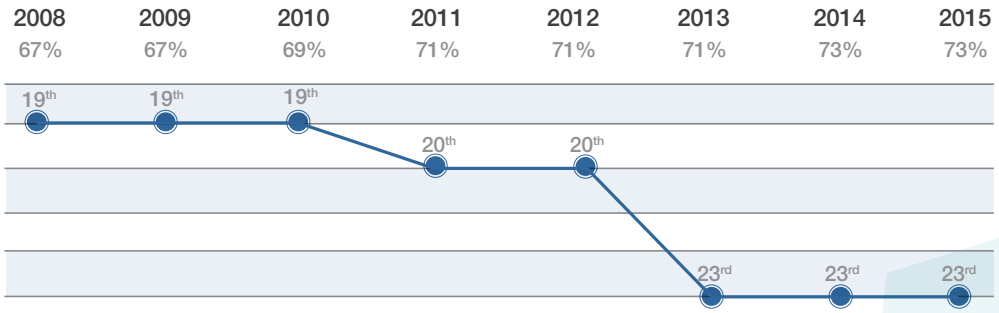
AVERAGE ACT SCORE

Source: ACT.org



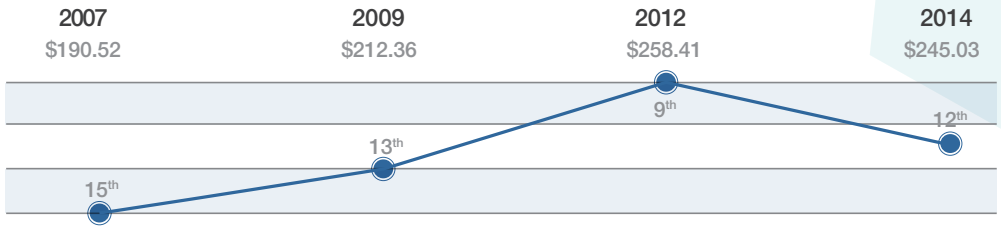
% OF GRADUATES TESTED FOR ACT

Source: ACT.org



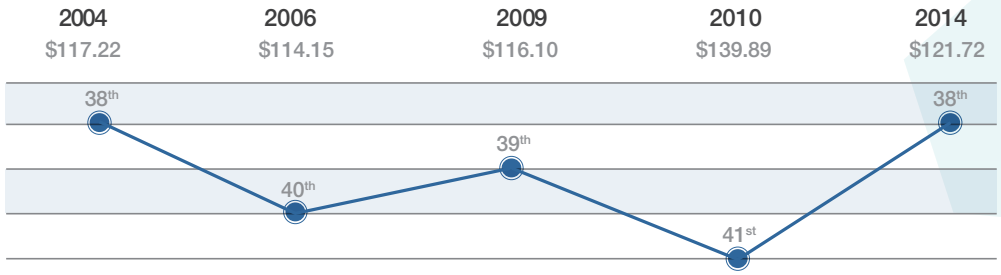
ACADEMIC R&D DOLLARS PER CAPITA

Source: Milken Institute



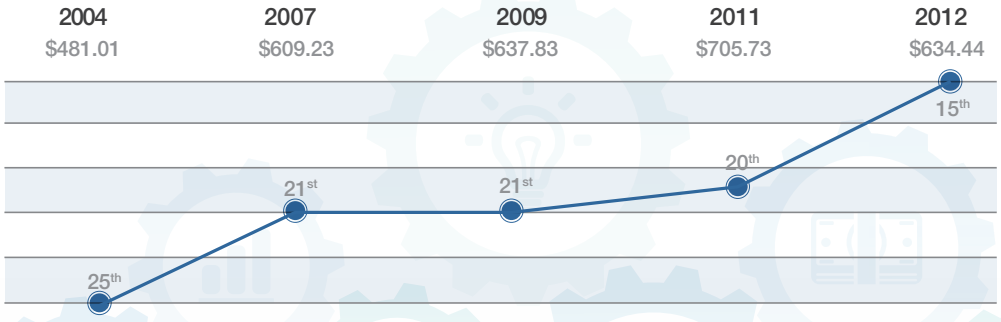
FEDERAL R&D DOLLARS PER CAPITA

Source: Milken Institute



INDUSTRY R&D DOLLARS PER CAPITA

Source: Milken Institute

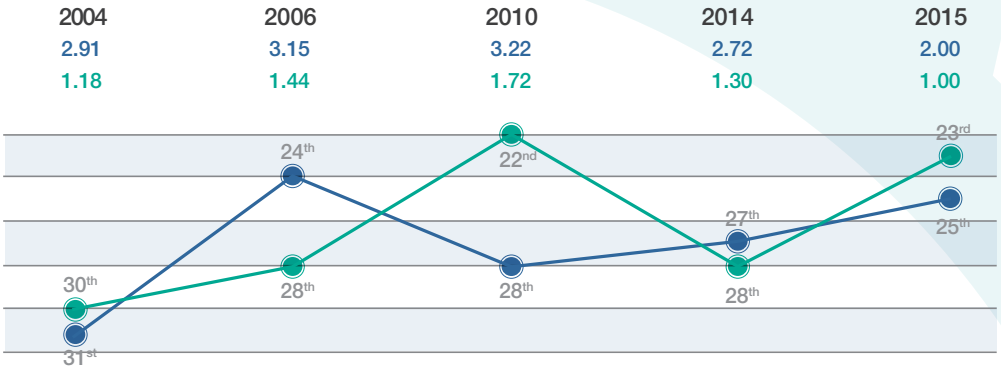


SBIR AWARDS PER 10,000 BUSINESSES

Source: Milken Institute

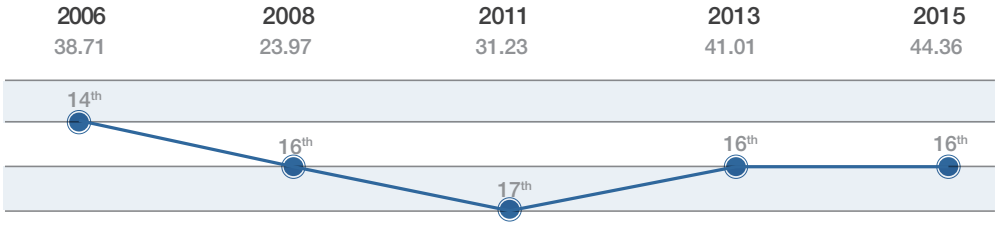
Phase 1 SBIR Awards

Phase 2 SBIR Awards



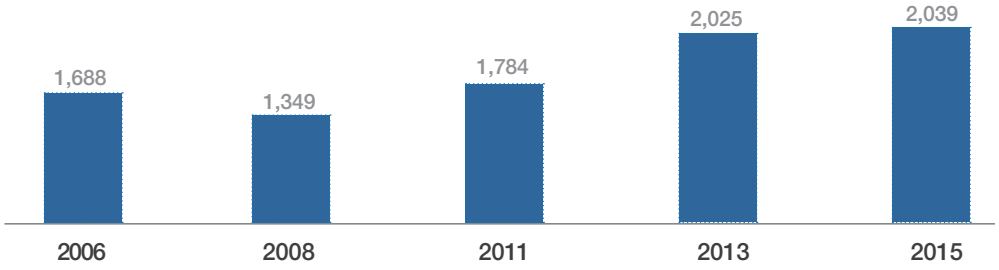
PATENTS ISSUED PER 100,000 PEOPLE

Source: Milken Institute



TOTAL PATENTS ISSUED

Source: U.S. Patent & Trademark Office

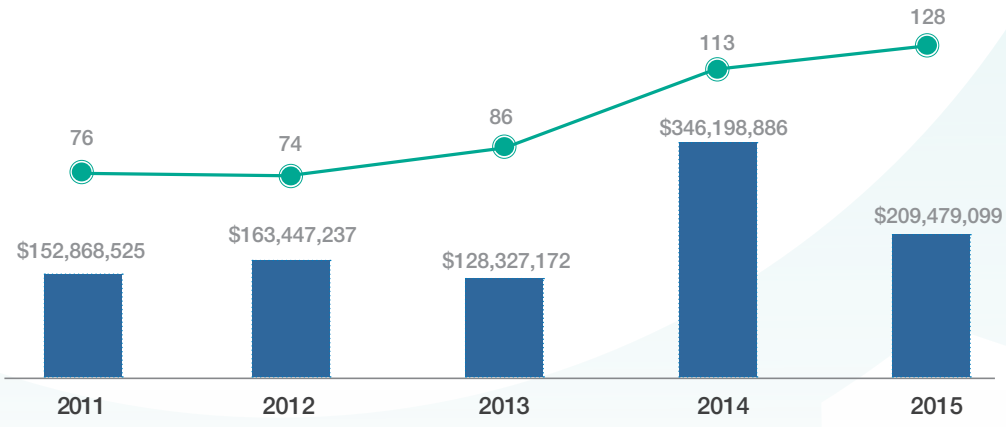


EARLY STAGE CAPITAL INVESTMENT

Source: WI Portfolio

Capital Raised

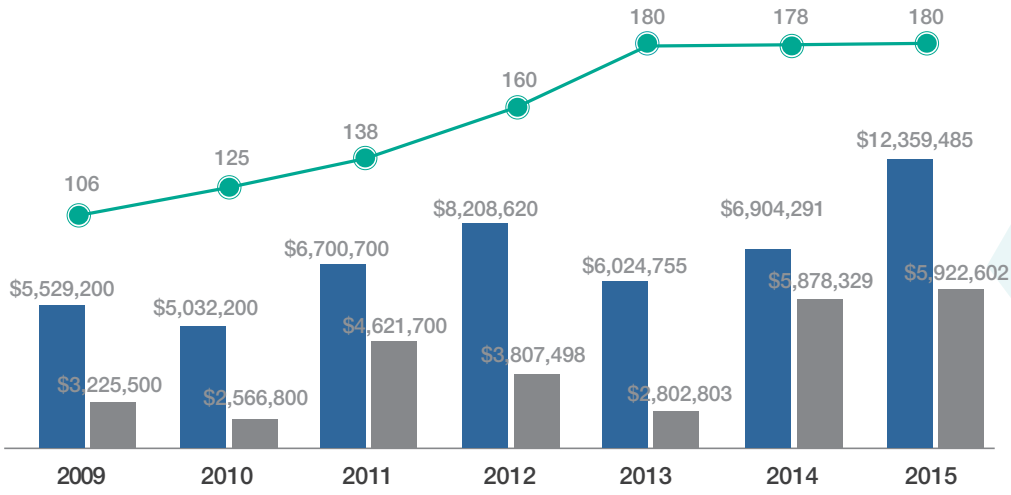
Number of Companies



ACT 255 TAX PROGRAM

Source: WEDC

- VC Tax Credits
- Angel Tax Credits
- Total QNBV Companies

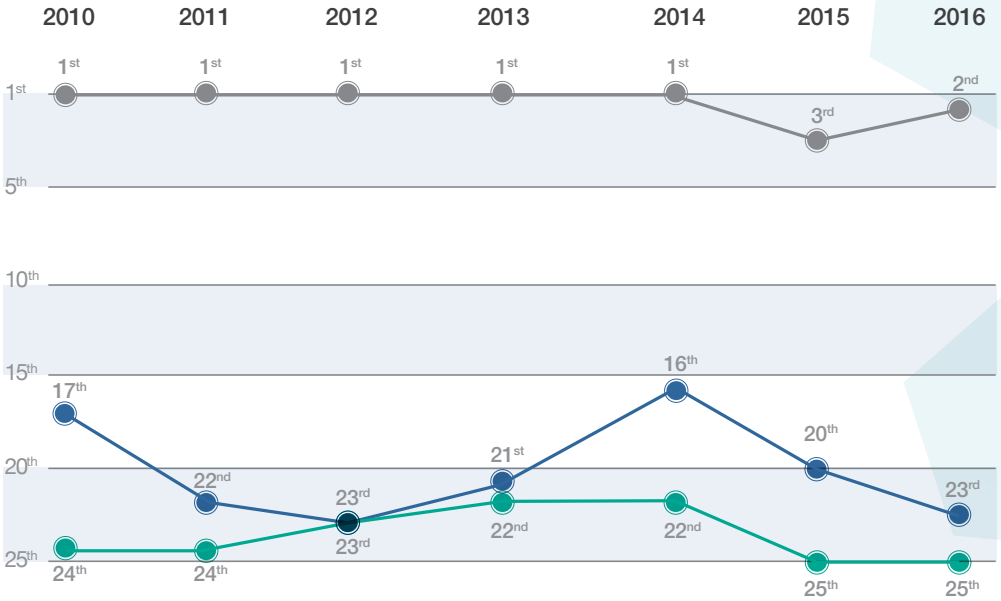


KAUFFMAN INDEX RANKING*

Source: Kauffman Foundation

- Main Street Entrepreneurship
- Startup Activity
- Growth Entrepreneurship

***OUT OF 25 LARGE STATES**



STATE TECHNOLOGY AND SCIENCE INDEX COMPONENTS

Technology and Science Workforce Index - This composite measures the relative presence of high-end technical talent. Eighteen indicators are included in this composite index. (The Technology and Science Workforce index has been updated for the 2016 ranks to include more occupations. This is in order to better represent the current high-tech workforce in each states' high-tech sector.)

Human Capital Investment Composite Index - This looks at how much is invested in developing the workforce—the most important intangible asset of a regional or state economy. Twenty-one indicators are included in this composite index.

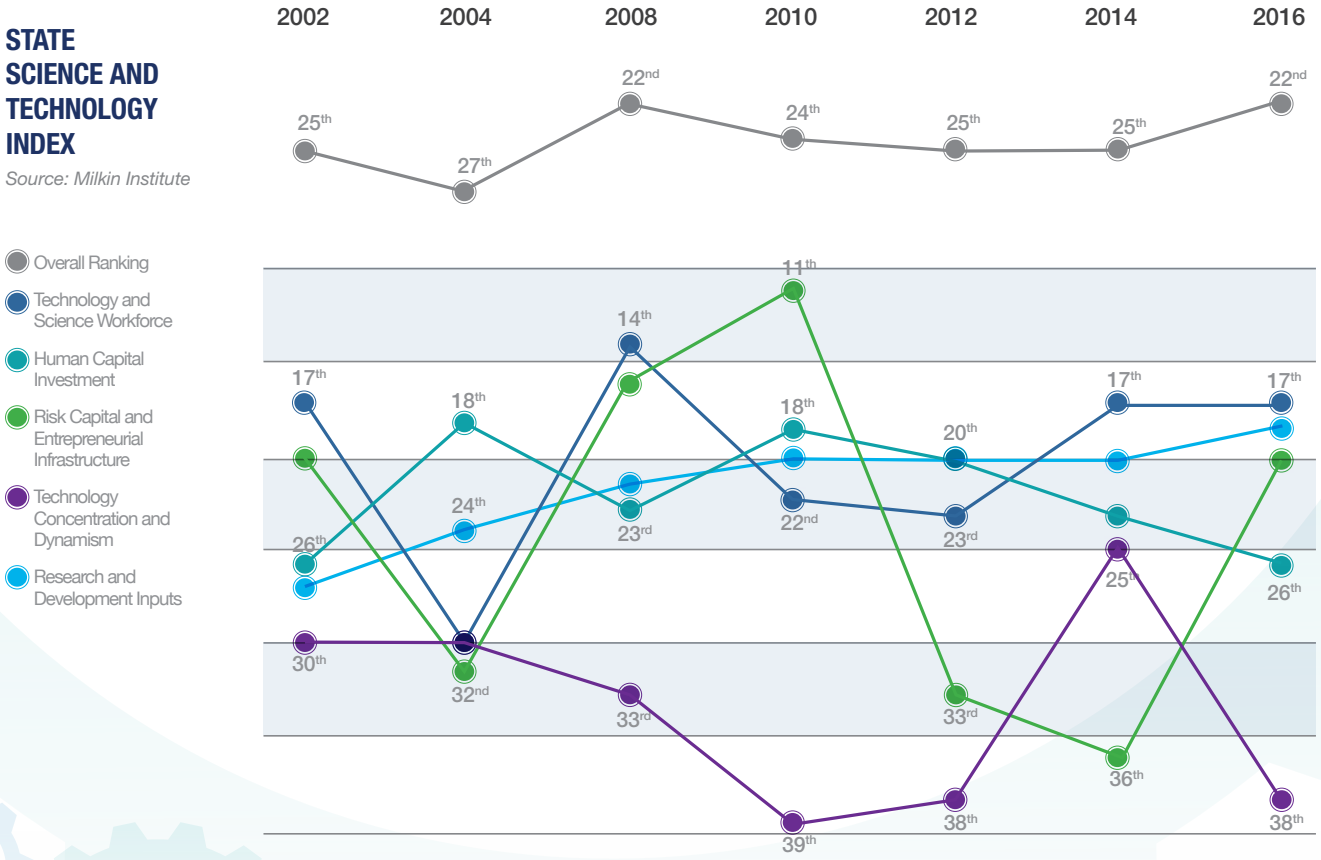
Risk Capital and Entrepreneurial Infrastructure Index - This determines the success rate of converting research into commercially viable products and services. Twelve indicators are included in this composite index.

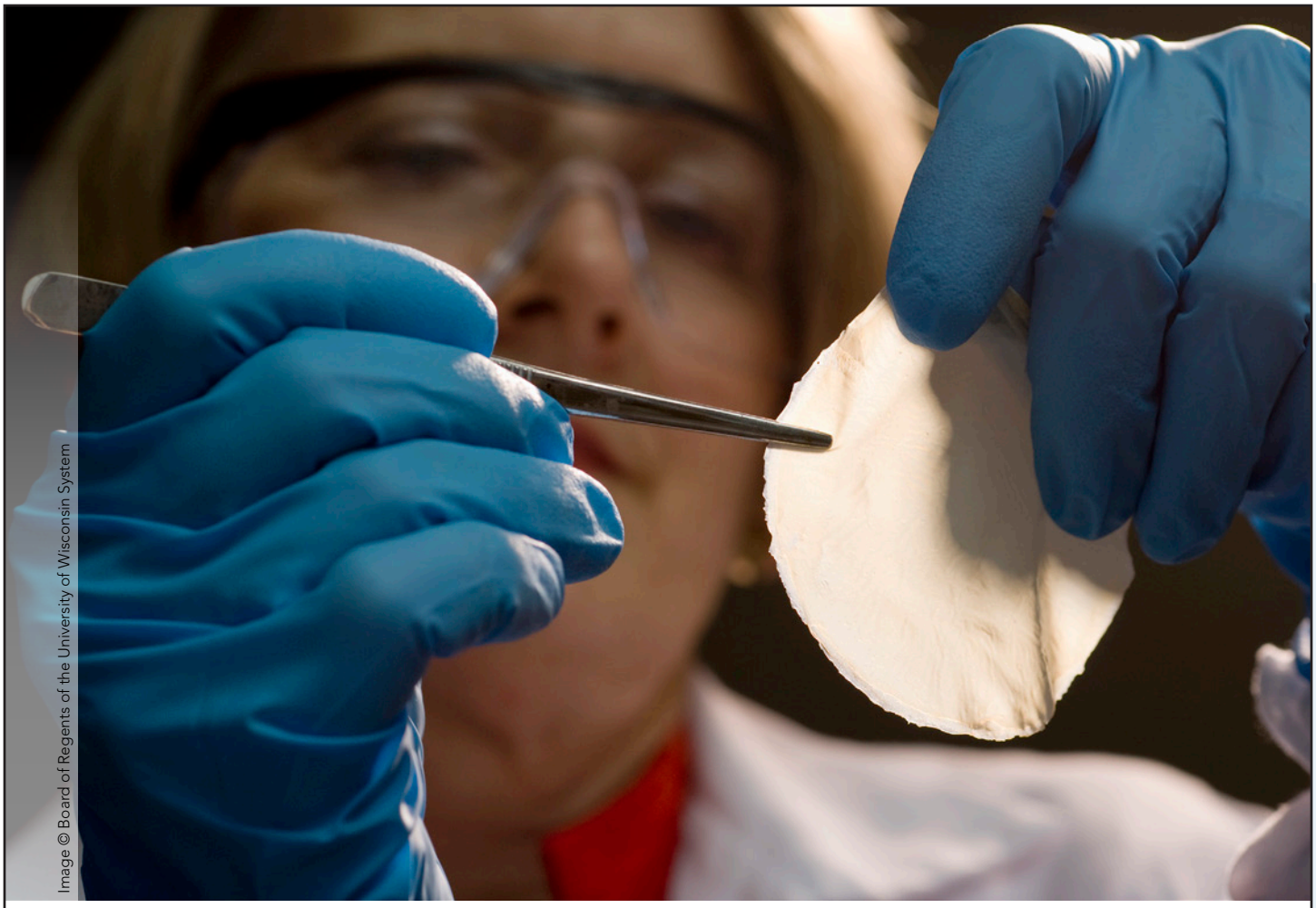
Technology Concentration and Dynamism Index - This evaluates technology outcomes to assess how effective policymakers and other stakeholders have been at parlaying regional assets into regional prosperity. Ten indicators are included in this composite index.

Research and Development Inputs Composite Index - This examines a state's R&D capacity to see if it has the facilities that attract funding and create innovations that could be commercialized and contribute to economic growth. Eighteen indicators are included in this composite index.

STATE SCIENCE AND TECHNOLOGY INDEX

Source: Milkin Institute





Helping UW–Madison *improve* the World

Since 1925, WARF has been investing in research at the University of Wisconsin–Madison, partnering with companies all over the world to help the landmark discoveries of the university **improve the lives of millions**.

From new ways of combatting bacteria to technologies that lead to faster, greener and more powerful computers, from long-lasting, reliable batteries to improved tools for scientists and physicians, WARF helps innovations from across campus benefit the world.

WARF
Wisconsin Alumni Research Foundation

WARF.ORG

INVESTING IN RESEARCH, MAKING A DIFFERENCE.

PROUDLY SPONSORS

Wisconsin Technology Council

2017 'white papers'

Providing high impact entrepreneurs with experienced legal counsel and strategic advice that reflects broad and deep familiarity in venture capital across the state, region and nation.

Paul A. Jones • Co-Chair
pajones@michaelbest.com
608.283.0125

Gregory J. Lynch • Co-Founder
gjlynch@michaelbest.com
608.283.2240

Melissa M. Turczyn • Co-Chair
mmturczyn@michaelbest.com
608.257.7484

Austin, TX • Chicago, IL • Denver, CO • Madison, WI • Manitowoc, WI
Milwaukee, WI • Salt Lake City, UT • Washington, D.C. • Waukesha, WI

venturebest.com

Board of directors

James Antczak
Biomedical Technology Licensing Manager, Medical College of Wisconsin

Eric Apfelbach
CEO, Pegasus Sustainability Solutions

Mark Bakken
Managing Partner, HealthX Ventures

Jay Bayne
Research Professor, Marquette University

Vivek Bhatt
CTO-Hardware, GE Healthcare

Angela Brzowski
Senior Design Phase Manager, Mortenson Construction

Sujeet Chand
SVP and Chief Technology Officer, Rockwell Automation

Scott Coward
SVP and General Counsel, Exact Sciences Corp.

Deron Curliss
Partner, BDO
BOARD TREASURER

Jim Dahlberg
Professor, UW-Madison; co-founder, Third Wave Technologies

Randy Dimond
Chief Technical Officer, Promega

Paul Eberle
Deputy Chief Executive Officer, Husch Blackwell

Jan Eddy
Member, Phenomenelle Angels and Belle Capital

Mark Ehrmann
Partner, Quarles & Brady, LLP

Michael Flanagan
President, Flanagan Financial, Inc. and Functional Biosciences, Inc.

Jonathan Fritz
Chief Strategy Officer, Symphony Corporation

Charlie Goff
Partner, NEW Capital Management

Terry Grosenheider
Wealth Management Advisor, The Private Client Reserve, U.S. Bank N.A.

Aaron Hagar
Vice President, Division of Entrepreneurship and Innovation, Wisconsin Economic Development Corporation

Susan Healy
Senior Vice President of Financial Planning & Analysis, Strategy & Procurement, Ulta Beauty

Bill Hickey
Principal, Wolf Track Ventures

Jim Jermain
Regional Vice President, AT&T

Rich Johnson
Wisconsin Medicaid Account Executive, HP Enterprise Solutions

Lorrie Heinemann
President, Madison Development Corporation

Rochelle Klaskin
General Counsel, State of Wisconsin Investment Board

Susan LaBelle
Executive Director, UW-Madison Office of Corporate Relations

Randall Lambrecht
Senior Vice President, Aurora Healthcare

Brian Lindstrom
CEO, Catalyze

Greg Lynch
Senior Partner, Michael Best
BOARD VICE-CHAIRMAN

Chuck McGinnis
Senior Director, Johnson Controls Inc.

John Neis
Managing Director, Venture Investors, LLC

Aaron Olver
Director, University Research Park

Ilke Panzer
Senior Vice President, Diagnostic Lab, BloodCenter of Wisconsin

Jim Pavlik
Partner, Baird Capital

Alexander "Sandie" Pendleton
Owner, Pendleton Legal, S.C.

Chris Reader
Director of Health & Human Resources Policy, Wisconsin Manufacturers and Commerce

Dan Reed
Managing Director, American Family Ventures

Ian Robertson
Dean, UW-Madison, College of Engineering

Greg Robinson
Managing Director, 4490 Ventures

Jed Roher
Shareholder, Godfrey & Kahn

Arjun Sanga
Executive Director, WiSys Technology Foundation

Don Schlidt
CEO, Dedicated Computing

James Schmidt
Chancellor, UW-Eau Claire

Brad Schwartz
CEO, Morgridge Institute for Research

Suzanne Siegle
Dean, Concordia University

Toni Sikes
Co-CEO, CODAworx
BOARD CHAIRWOMAN

Tom Still
President, Wisconsin Technology Council

Michael Sussman
Director, UW-Madison Biotechnology Center

Carrie Thome
Director of Investments, Wisconsin Alumni Research Foundation

Brian Thompson
President, UW-Milwaukee Research Foundation

Tim Toepel
Treasurer and Vice President of Finance, Epic

Mark Tyler
President, OEM Fabricators, Inc.

Denise Webb
CEO, Marshfield Clinic Information Services and CIO, Marshfield Clinic Health System

Rolf Wegenke
President, Wisconsin Association of Independent Colleges and Universities

James Zylstra
Executive Vice President, Wisconsin Technical College System

Emeritus: Bob Brennan
Retired, UW-Madison Office of Corporate Relations and Greater Madison Chamber of Commerce