

TECHCONNECT

ARIZONA'S TECHNOLOGY MAGAZINE

THE TRADE ISSUE



05 Center Stage

06 Up North

08 It's a Deal

012 Maximizing Mexico

HOW DO YOU GET TO BE THE LEADER OF THE OTHER 49?



ARIZONA KNOW HOW. RANKED A BEST PLACE FOR BUSINESS.

In Arizona, we kick the future into high gear. So do the top-level talented people moving here for unbeatable lifestyle and opportunities. Arizona is a best state for business. We're 1st in the nation for job growth. We have the country's largest public university graduating the best and brightest in high-demand disciplines. Arizona's undisputed top-line priority is supporting and backing business. Icons Intel, Avnet, Boeing, GoDaddy and more thrive here. Our aggressive pro-business, tax reductions and pro-growth legislation mean record relocations and expansions. Simply put, our state leads the pack. When it comes to success, Arizona is all business.



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COMMERCE
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CONTENTS

WINTER 2016

TECHCONNECT

ARIZONA'S TECHNOLOGY MAGAZINE

+ COVER

012

Arizona sees new opportunities in Mexico that lie far beyond Sonora.



05 CENTER STAGE
Work begins in plan to position Phoenix area as export hub.

06 CANADA
Huge potential remains for doing business with northern neighbors.


08 TRADE AND TECH
'Cheat sheet' for making most of new agreement landscape.

In Every Issue

- 015** Message from the Governor
- 016** Arizona State University
- 017** Northern Arizona University
- 018** The University of Arizona
- 019** TGen

Global Connection

AEROSPACE PROGRAM A NEW EXPORT OPPORTUNITY FOR ARIZONA

 rizona companies have a lot to be optimistic about when it comes to trade opportunities in global markets.

For starters, Gov. Doug Ducey is leading an ambitious trade agenda with Mexico, which includes a keen focus across all regions of the country—not just Sonora, where Arizona has long maintained an important and robust manufacturing relationship. This effort is already yielding results for businesses looking to boost their export opportunities and gain access to new customers and markets.

As you'll read in this issue of TechConnect, in just the past several months the Arizona Commerce Authority (ACA) has helped connect Arizona companies to numerous supply chain opportunities across Mexico, including a mining expo in Acapulco, an aerospace expo in Mexico City, an advanced manufacturing trade event in Tijuana and a maquiladora supplier expo in Nogales. Upcoming is a B2B trade mission to Mexicali for Arizona companies looking to sell into the supply chain of Mexico's largest aerospace cluster, Baja California.

From a programmatic perspective, ACA also has a lot to be optimistic about.

Two years ago, we launched a successful program called ExporTech, which is specifically designed for companies that see growth opportunities in global markets but are running into technical challenges involving the time and expertise it takes to develop a smart export plan. The city of Phoenix joined us as a partner to present ExporTech in 2015. Arizona companies that have graduated from ExporTech already are realizing export sales and business growth as a result of the program.

I'm proud to say that because of our high-achieving ExporTech program, the National Institute of Standards and Technology, and the U.S. Department




SANDRA WATSON

of Commerce recently selected Arizona as one of only three states (the others are Maryland and Oklahoma) to develop and launch a first-of-its-kind export program for the aerospace sector. Another factor, of course, involves our state's rich tradition as a major aerospace and defense hub in the United States.

This new program will be a 60-day boot camp for companies in the aerospace sector. Each will be assigned an export coach, get access to important connections in global markets and graduate with an export plan that will help them accelerate their sales.

A big part of what will make this a successful program is the "go-to market" component that follows the 60-day boot camp. We will be assisting graduating companies to undertake a variety of concrete and pragmatic export initiatives such as targeted trade missions and expos, where they will meet with pre-vetted potential distributors, representatives and end buyers in target markets, as well as other initiatives to ensure the Arizona companies have the right opportunities to effectively implement their export plans.

We are in the process now of selecting eight companies to participate in the aerospace export program, which will run February through April. It will be based in the Greater Phoenix area. Stay tuned for future reports about the export success these aerospace companies are sure to achieve, thanks to this program.

I am confident that, under Gov. Ducey's leadership, trade will continue to be on the rise in Mexico and in other foreign markets. That's good for businesses, and it's good for Arizona! 

SANDRA WATSON is president and CEO of the Arizona Commerce Authority.



CENTER STAGE

Major plan to make Phoenix export hub begins move forward

Why be the spoke in a wheel when you can be the hub?

This is the thinking behind the Greater Phoenix Export Plan Metro Export Initiative that lays out details for establishing the metro area as a global trade hub by connecting small- and medium-sized suppliers and new businesses to growing markets. That is especially true for technology sectors such as aerospace, whose exports, the report notes, have climbed steadily since 2010 due primarily to increased—and growing—demand for commercial aircraft.

It's now time for liftoff on making recommendations in the plan a reality through efforts of the nonprofit Metro Phoenix Export Alliance (MPEXA). A major step is the recent naming of Dawn Nagle as MPEXA's director. She likely is best known in local trade circles as the former trade commissioner for the Consulate of Canada's Department of Foreign Affairs and International Trade. "I'm happy to see this initiative come forward," Nagle says.

She is quick to credit the critical drivers of the plan. Through participation in the "Global Cities Initiative: A Joint Project of Brookings and JPMorgan Chase," it was developed by the Greater Phoenix Economic Council in collaboration with

political, business, and civic leaders of the Greater Phoenix region.

Nagle now begins the work of reaching out to members of task-oriented subcommittees and strategic subcommittees in place to get them involved. "We'll be building on all they have done," she says.

For example, one of the recommendations of the report is to forge new and strengthen existing relationships with trade assistance organizations in Canada, Mexico, Western Europe and emerging and compatible markets. Nagle will put her experience and relationships to work. "North America is a good place to start," she says.

The report already offers some areas of concentration. "The regional economy is driven by long-standing industrial pillars established in the mid-20th century, including aerospace, semiconductors and electronics, and their vast networks of small- and medium-sized suppliers of technology and manufactured components," according to the report.

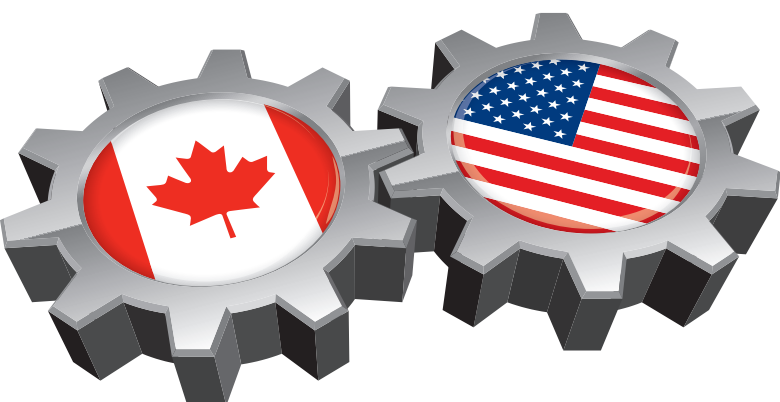
But when it comes to technology, Nagle says, "It's not just about exporting products and devices but services." Those could include app development and different types of tech design services. If the service sector's overall track record is any indication, there are potential dividends waiting in technology. During the last decade, service sector exports jumped more than 79 percent in Greater Phoenix.

For more information, including a copy of the plan, go to www.mpexa.com.

KEY PARTNERS

Organizations committed to executing the export plan include:

- Arizona Commerce Authority**
- Arizona Department of Transportation**
- Arizona District Export Council**
- Arizona-Mexico Commission**
- Arizona Office of Tourism**
- Arizona Small Business Association**
- Arizona State University**
- Arizona Technology Council**
- Chambers of Commerce**
- Economic Development Directors Team**
- Greater Phoenix Economic Council**
- Maricopa Association of Governments**
- Minority Business Development Agency**
- Thunderbird Global School of Management**
- Transportation and Trade Corridor Alliance**
- U.S. Export Assistance Center**
- U.S. Small Business Administration**



NORTH TO SOUTH

Canada, Arizona continue to see opportunities with each other

When a state and a nation can achieve a bilateral trade relationship valued at \$3.7 billion, that's remarkable.

Perhaps even more remarkable is this actual tie between Arizona and Canada is less than 1 percent of the total \$750 billion generates in the trade corridor between the United States and Canada.

You can understand why R. Glenn Williamson gets so excited when he talks about the potential that remains for growth in the trading partnerships between Arizona and Canada. Williamson is the founder and CEO of the Canada Arizona Business Council, which was created to promote and increase bilateral foreign direct investment, trade, and tourism.

The larger share of the relationship originates north of the border. Williamson estimates Canada now has 350 companies in Arizona. A lot of that has stemmed from a desire to be closer to the customer. With more than 75 percent of Canada's business done with the United States, most Canadian companies have offices in the United States, he says.


Further, it's not all a one-way street. There are 150 Arizona companies operating in Canada, Williamson says, with names such as Avnet and Lattice Biologics well established to the north.

The starting point for all of this action can be traced back more than 50 years ago. That's when Canadians discovered Arizona as a vacation destination, with tourism laying the foundation for business relationships. "I've seen this over and over again," Williamson says. "It's natural and doesn't have to be forced."

There also was an evolution of types of businesses coming here, especially technology. For example, mining led to aerospace then to tech and cyber. Even in the recession, William says, young executives were buying homes here. Relationships also have migrated from just those in the western Canada to connections to the eastern region, especially Toronto. "Now we see broader interest in companies here," he says.

In particular, software industry employees are drawn to lifestyle in Arizona and likewise decision makers like it here, Williamson says. That has translated into more activity. For example, CGI, a provider of information technology and business process services, has doubled its employee roster while Mitel has established a cloud workforce in Mesa, he says.

Add startups to the mix, too. "Canada doesn't have venture capital per se," Williamson says, so that leads to the early-stage companies looking for other places to stand out to investors. "Junior markets are good places to show off startups," he says.

Also part of the draw to this state is proximity—for Arizona as well as Canada—to that other trading partner, Mexico. There are Canadian companies here and Mexico. For example, communications manufacturer Sinclair Technologies has 900 employees in Guaymas. The size of operations at the Mexican sites is a reason one of Williamson's favorite sayings has become, "We are watching Canadian manufacturing offshore to Arizona." 



WORLD SHOWCASE

Arizonans invited to partner with U.S. at key German trade fair

With Arizona being among a handful of states actually having its trade activity move into positive territory, it's no wonder that organizers of HANNOVER MESSE—one of the largest trade expos in the world—were in the state recently to personally extend an invitation for companies here to attend the annual event in northern Germany.

The U.S. Commercial Service collaborated with the German-American Chamber of Commerce and Global Chamber to host organizers of 2016 HANNOVER MESSE, which will be held April 25-29. The added significance for next year is that the United States is the Partner Country for the world's leading trade fair for factory and process automation, systems solutions and industrial information technology. Recent past Partner Countries were India (2015), The Netherlands (2014), Russia (2013), China (2012) and France (2011).

Meeting with the delegation was Steven G. Zylstra, president and CEO of the Arizona Technology Council. "We are getting attention since we were one of the only states with export growth in the recent past," he says. Exports from Arizona are expected to increase this year by 10 percent compared to 2014, making the state


one of only seven reporting growth so far this year. Zylstra added that the Commercial Service extended an invitation to him because its representatives know Council members are ideal prospects for this event.

In case you're wondering how big this event is, consider the numbers from last year:

- More than 200,000 attendees – They included global investors, buyers, distributors, resellers and members of the business media, and more than a third were from outside of Germany.
- 6,500 exhibitors from 70 countries
- More than 100 business delegations – They represented industry, business and government.

"Let me be clear: HANNOVER MESSE attendees aren't window shopping. About 68 percent of attendees come to the show with decision-making authority, meaning they are ready to meet you, negotiate and close," says Vinai Thummalapally, executive director of SelectUSA, which with the U.S. Commercial Service Germany will host the fifth annual USA Investment Center at the show. The U.S. Investment Pavilion will be the dedicated area where state and local economic development agencies will present the United States as business-friendly and discuss investment opportunities on American soil with potential partners from around the world.

Arizona-based companies attending should be in good company if testing German waters for the first time. Consider that Microsoft's inaugural attendance at HANNOVER MESSE occurred last year and the tech giant will return in 2016 with twice as much show space. Also appearing for the first time will be the U.S.-based Industrial Internet Consortium that will join Germany's leading research organizations and trade associations, including BITKOM (Digital Association of Germany), VDE (Association for Electrical, Electronic & Information Technologies) and ZVEI (German Electrical and Electronic Manufacturers' Association).

To learn more about attending, visit export.gov/hannovermesse. 



TRADE AND TECH

A 'cheat sheet' to help maneuver through new agreements

a rizona companies are regularly dealing with customers and competitors from outside the United States. Technology companies know better than most that dealing globally is an economic imperative. That's why understanding U.S. treaty negotiations that have been in the news this year—and will continue to be so—can be a game changer for tech companies expanding globally.

FREE TRADE AGREEMENTS

The U.S. has 20 Free Trade Agreements (FTAs) with other countries. FTAs generally require that countries reduce tariffs, protect intellectual property and provide market access to non-local companies. FTAs also address technical regulations and standards that unnecessarily restrict trade. Because the U.S. has the lowest tariffs globally and provides market access to many


foreign industries, FTAs particularly benefit U.S. companies selling globally. Arizona exports to FTA countries totaled \$12.4 billion, or 59 percent, of Arizona's exports in 2014. From 2005 to 2014, exports from Arizona to FTA markets grew by 61 percent, with NAFTA countries—U.S., Mexico and Canada—and FTA countries—Korea, Israel, Australia and Chile—showing the largest dollar growth during this period.

TRADE IN THE NEWS

Think of the recent trade negotiations as FTAs on steroids. These agreements help U.S. companies expand sales overseas by leveling the competitive playing field in many different countries at once. Here is a "cheat sheet" so you can understand the alphabet soup used when discussing current trade issues and the potential opportunities for tech companies:

- **Trade Promotion Authority (TPA):** The Foundation – Reauthorized by Congress earlier this year, TPA gives the president the continuing flexibility to negotiate trade agreements on behalf of the U.S., subject to Congress’ pre-defined negotiating objectives, oversight and consultation.
- **Trans-Pacific Partnership (TPP):** Asia-Pacific FTA – The TPP is a multi-country FTA that covers the U.S., Australia, Brunei Darussalam, Canada, Chile, Japan, Malaysia, Mexico, New Zealand, Peru, Singapore and Vietnam. TPP will expand current FTAs and create new agreements with some of these countries. TPP negotiations have concluded and each country is reviewing the terms internally to decide if it will agree to incorporate TPP into its laws. (A summary of the terms can be found [here](#).) Congress is reviewing TPP to determine if it will approve the U.S. taking part. In 2014, Arizona exported \$21.2 billion in goods to the world, with 61 percent of Arizona’s goods going to the TPP countries. This does not count exports of services such as software licensing, financial and tourism provided by Arizona companies to foreign customers. TPP will eliminate foreign tariffs in the nations that are part of the agreement, which will help Arizona companies expand sales in those countries by reducing final prices to customers. For example, today there are tariffs as high as 35 percent on U.S. Information and Communication Technology (ICT) products imported into some TPP countries. Under TPP, 99.6 percent of all U.S. goods exported will have zero tariffs in TPP countries. TPP also will expand market access and investment opportunities in a number of service sectors, including entertainment, telecommunications, software licensing and Internet industries. Reduced tariffs and expanded market access will mean opportunity for Arizona technology companies and an increase in high tech jobs in Arizona.
- **Transatlantic Trade and Investment Partnership (T-TIP):** The European FTA – Surprisingly, while the U.S. has FTAs with certain countries in Europe, there is no overarching FTA despite the fact that the transatlantic economic relationship accounts for nearly half of global economic output. Negotiations of T-TIP are ongoing, with negotiators hoping to conclude in 2016 for each country’s final approval. Arizona exported an average \$3.2 billion annually in goods to the European Union (EU) from 2012 to 2014. The ICT sector accounted for 19 percent of Arizona’s total exports to the EU between 2012 and 2014, averaging \$572 million per year. The EU currently has tariffs on ICT products as high as 14 percent. Arizona tech companies would benefit from reduced tariffs in this sector as a result of T-TIP. Exports from Arizona also could benefit from related efforts to achieve new market access commitments in services and investment, improve the regulatory environment, and establish global best practices.

TAKING ADVANTAGE

If the winners in the next economy will be those who tap new global markets, what can you do? Consider how your products, technologies and services could be used outside our country, especially in countries with which the U.S. already has an FTA. These are “low hanging fruit” for Arizona companies expanding globally. And, keep an eye on the news. As Congress reviews—and hopefully approves—TPP and T-TIP, find out how these new treaties can benefit your tech company. There are resources in Arizona to help you use current FTAs, TPP and T-TIP to your advantage. Find out more at www.exportaz.org. 



KAREN DICKINSON is an international business and intellectual property attorney at Polsinelli, and chair of the Arizona District Export Council.



Doug Bruhnke

He helps Arizona companies make entry into export arena

For many members of the trade community in Arizona, one name instantly comes up as a leader in his field: Doug Bruhnke. As CEO and founder of Growth Nation® and Global Chamber® (www.globalchamber.org), Bruhnke has been involved in helping companies grow locally and globally. In his career, he has

developed programs for clients ranging from Harley-Davidson and Honeywell to SAP and Sony. TechConnect asked Bruhnke to talk about his journey and the state of trade.

What prompted you to focus on global trade for a career?

Back when I was a new chemical engineer with the DuPont Company, I was doing technical support on polymer products for Asian customers, and enjoyed the fact that they viewed the world differently and pushed us in ways that U.S. customers did not. I saw opportunity in that to grow the business. My first trip was to Korea. I arrived a day early in Seoul, walking all over the city on a cold and snowy day, absorbing the sights, sounds, smells and tastes. From that day I was hooked! Since then, I've lived overseas twice, traveled to 50 countries and had countless memorable experiences—nearly all good! Our daughter had the chance to grow up in Tokyo and Singapore, and it helped her evolve into an amazing young woman. To me, doing business in the U.S. only is intolerably dull.

And how did that escalate into launching the Global Chamber?

Two primary triggers created Global Chamber®. First, a prominent person stood up in a Phoenix public meeting and declared that foreigners should be kept out of Arizona because they take jobs. That was so wrong, the next day I was inspired to start a monthly meet-up discussing global business. The basic idea for Global Chamber® was born! Then I thought that we could make global business easier for companies if we built a network of talented and trusted people in cities around the world, and created a chamber where membership in one city meant membership and connections everywhere. Now that's what we're doing. Our audacious dream was complete, with global headquarters in Phoenix. Mayor Greg Stanton has been extremely supportive, and now mayors and businesses all over the world are jumping in as we start chapters in 500 metro areas. We're the only

organization in the world dedicated to trade across every border that collaborates with every organization. We're still more vision than reality but we're ahead of schedule and our network is growing every day.

What conditions makes this the right time to be involved in foreign trade?

It used to be that U.S. companies could simply grow in the states and that was enough. Now, most business growth is happening somewhere else. Opportunity knocks and far too few are proactively capturing it. Less than 1 percent of U.S. companies export, and three out of four of those are exporting only because a buyer approached them, not because they planned it. Over half of exporters do business in only one country, and in over half of those, that country is either Mexico or Canada. So the number of companies proactively exporting to multiple countries beyond border countries is infinitesimal. It's time.

Are there issues specific to science and technology when it comes to becoming involved in international trade? How can they be overcome?

Today technology facilitates trade in so many ways: from finding customers to the day-to-day of doing business. With cross-border trade, it's important to have a cadre of team members that you know, like and trust to help reduce risk and increase success. And so we're using technology, including the Global Chamber® Virtual Portal, and talented people to help companies navigate the world. We've found tech companies tend to want to do everything themselves, and that usually results in multiple mistakes—and sometimes in disaster. Overcoming human behavior is often the biggest challenge! Perseverance is required, and preferably tech companies can be open to help before the problems start.

In a Global Chamber® blog posting, it was stated that one of the most difficult challenges is securing adequate growth capital

to fuel the rapidly growing, export-driven company. Growth capital is a challenge for the startups even without exporting. How can it be overcome the second time around?

Just like U.S. companies, U.S. funding organizations also tend not to be very global. They often stick with what they know and far too few investors are comfortable with global business, so it's a challenge. But there is a growing number of high net worth individuals in other countries who know business. So cross-border investing is a significant opportunity. Global Chamber® is working on connecting more foreign investors to U.S. companies who seek global expansion.

Are the opportunities wide open for science/tech in general or are there particular fields more likely to succeed because those products seem to be lacking in other countries? And for services?

There are no limits to growth opportunities and often they may not be what you think. A simple example is wireless phone technology. As communities are developing across Africa, phone systems have gone directly to mobile rather than land-based phone infrastructures. That has implications for every kind of technology—mobile or otherwise. Mobile mania impacts the demand for services like banking, where in Nigeria transactions can be done easily by phone.

There's likely demand for your products or services, or something like them, in other countries. Education, medical products, infrastructure, technology and food are all hot areas. Take the leap and then be creative, flexible and resilient. Understand new markets and discover what you can deliver. Too many times the assumption that what works in one country will work in another is a recipe for disaster. But chances are that if you do the fundamentals of listening and adjusting as you navigate the world, you'll find opportunity. To paraphrase Al Franken's character Stuart Smalley, "You're good enough, you're smart enough, and doggone it, people will like you." 🐶



Maximizing Mexico

From ‘Sonora or Bust’ to ‘Sonora *and Beyond*’

a rizona has an obvious geographic advantage over most states when it comes to trade opportunities for companies looking to expand in Mexico. And, historically, there has been no greater trade partner than Sonora, a hotbed for manufacturing centers—known as *maquiladoras*—situated along the border.

These facilities are incredibly important to both economies. *Maquiladora*-related trade pumps about \$304.9 million into the economy of Santa Cruz County alone along with 1,140 direct jobs there, according to a 2013 study by The University of Arizona’s Economic and Business Research Center.

Over the past year, however, state economic development officials led by Arizona Gov. Doug Ducey have been pursuing a

broader, more holistic strategy when it comes to Mexico. There is an emphasis on building business relationships in all of Mexico, presenting tremendous growth opportunities for Arizona companies looking to tap into Mexico’s lucrative supply chain not only *in* Sonora but *beyond* Sonora.

Many Arizona businesses might be surprised to learn that Mexico’s largest—and closest—aerospace cluster is actually in Baja California, which borders the U.S. state of California. It’s only a four-hour drive to Baja’s capital, Mexicali. Arizona-based aerospace giant Honeywell operates a facility there, as does one of its suppliers, Phoenix-based Allied Tool & Die. More companies from Arizona work there while others will expand into the Baja region in the near future.

“Given its dynamic and growing advanced manufacturing sectors, Mexico is an ideal export market for high technology Arizona companies.”

- Sandra Watson, president and CEO of the Arizona Commerce Authority

By contrast, the more well-known trade partner of Hermosillo, Sonora, is about a seven-hour drive. That's also where the Arizona Commerce Authority (ACA) and the Arizona-Mexico Commission have a well-established trade office.

As part of this broader approach, ACA has connected dozens of Arizona companies to trade opportunities across wide swaths of Mexico. In early December, the agency took seven Arizona companies on a business-to-business aerospace supply chain trade mission to Mexicali. The agency acts as a “matchmaker” of sorts on these trips, connecting Arizona companies to Mexican companies or foreign companies operating in Mexico.

Here are highlights from other trade missions and expos that ACA has led and participated in:

- **Aerospace & defense expo in Mexico City (April)** – Six Arizona companies participated in the ACA pavilion. One of these companies is actively advancing contract negotiations for a sale to the Mexican Air Force.
- **Maquiladora trade mission in Nogales (August)** – ACA and Arizona Mexico Commission led a successful trade mission to Nogales, Sonora, where a delegation of 22 Arizona companies showcased their products and services at the Maquila Supplier Expo.
- **Mining expo in Acapulco (October)** – Seventeen Arizona companies—the largest of the U.S. delegation—attended the event. Of these, five were small- and

medium-sized companies that participated in ACA's pavilion.

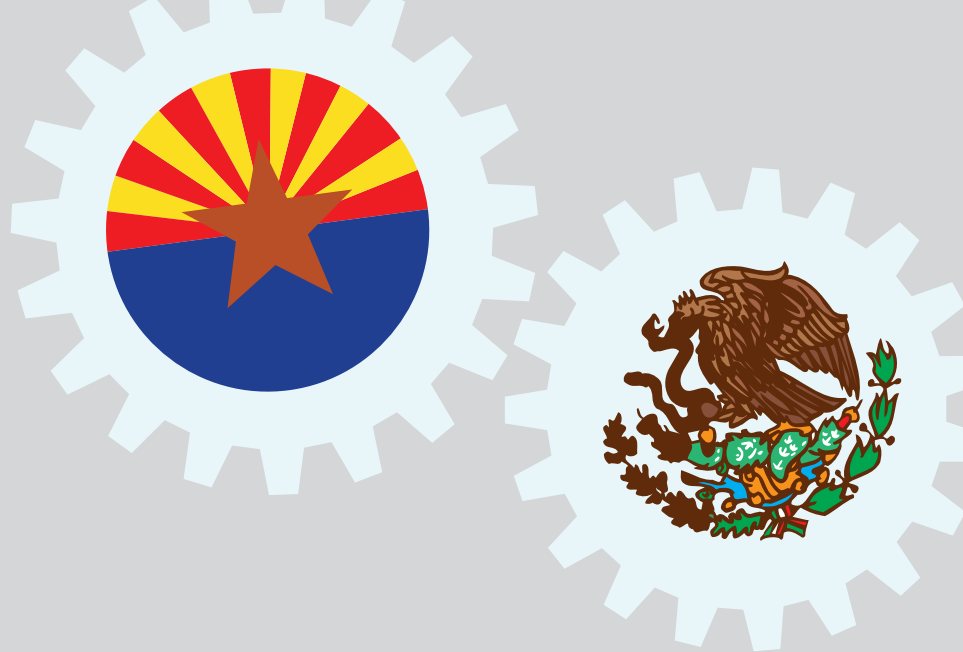
- **Advanced manufacturing trade event in Tijuana (November)** – Three Arizona companies participated in this event with ACA, and one of them made a \$250,000 sale at the show.

This is all underscored by Gov. Ducey's leadership when it comes to Mexico. In June, the governor led a delegation of about 50 Arizona business owners, CEOs and elected leaders to Mexico City, making it the first gubernatorial trade mission in nearly a decade.

Just as important were the Mexican dignitaries who greeted them. They included top government officials such as the Secretary of the Economy and dozens of Mexican CEOs, including telecom magnate Carlos Slim, one of the richest men in the world.

“It's hugely important for several reasons. Mexico is our No. 1 trading partner. You'll hear that phrase from a lot of people. But what does that really mean? From a business perspective, it means that it's your No. 1 supplier and your No. 1 customer,” says David Farca, an entrepreneur and president of the board of directors for the Arizona-Mexico Commission. “So if you are running a business and you haven't visited your top customer in 10 years, that's really inexcusable. The first thing that we talked about was, ‘We have to go visit our No. 1 customer and our No. 1 supplier.’”

Farca called the trade relationship with Mexico “one that is unique around the world.” For example, he explained that, particularly in the aerospace and automotive sectors, materials



can cross over the border seven to eight times before they become a finished product. “That’s a trade relationship that needs to be paid attention to,” Farca says.

Not only does the Grand Canyon State share a border with Mexico but the two also share common economic development goals. Mexico is forecasted to be the world’s fifth-largest economy by 2050, and the country has a growing middle-class comprised of millions of consumers with the ability to travel and explore cross-border business opportunities.

Arizona and Mexico hit a record \$15.9 billion in trade in 2014, one reason why the ACA in partnership with the city of Phoenix opened a trade and investment office in Mexico City last year.

“Given its dynamic and growing advanced manufacturing sectors, Mexico is an ideal export market for high technology Arizona companies,” says Sandra Watson, president and CEO of the Arizona Commerce Authority. “In addition, with Mexico’s growing middle class, there is considerable and ever-growing purchasing power in Mexico for a wide variety of Arizona-produced consumer goods.”

Arizona companies are indeed finding success there. In December, Arizona’s largest publicly traded company, Avnet, announced it was opening a new customer service center in Guadalajara, Jalisco.

Besides the booming high-technology

space, Watson points to Mexico’s vibrant aerospace sector, which has five important clusters: Baja California, Queretaro, Sonora, Nuevo Leon and Chihuahua. There are lucrative supply chain opportunities in each of these clusters for Arizona companies, Watson says.

In fact, one Arizona success story is the aforementioned Allied Tool. The company manufactures aerospace, automotive and medical products for major U.S.-based companies. Five years ago, the company opened a manufacturing facility in Mexicali to exclusively service Honeywell. Now it’s growing and expanding into other markets.

“We started out mainly doing work for Honeywell and we’ve branched out from there,” says Jeff Moorhead, vice president and general manager of Allied. “We have run out of room. We need more square footage, more capacity.” Moorhead anticipates hiring more employees and expanding into a facility that’s about double the size of his company’s current 9,000-square-foot building.

To be sure, the world is looking at the Mexico-U.S. relationship as a valuable economic development opportunity. The growing business partnership between Arizona and Mexico will continue to expand in the coming years because of our shared border, our symbiotic relationship and a more holistic strategy that encompasses all parts of Mexico. That is great news for companies on both sides of the border. ■

Toward a Bright Future **Arizona-based exports on track for biggest year ever**



Over the past year as governor, it's been a priority of mine to expand Arizona's brand into markets throughout the world.

Spreading the message that Arizona is the best place on the globe to do business is a full-time job and a key part of my trade agenda.

I'm proud to report that things are already headed in the right direction for our great state: Arizona's international exports have increased more than 10 percent in the first three quarters of 2015 compared to 2014.

This puts Arizona on track for the biggest year ever, exporting products valued at more than \$17 billion over the last nine months, according to the most recent data from Global Trade Information Services.

That's big news and more evidence that Arizona is indeed open for business!

It's been a busy and productive year:

- In June, I attended the world's largest gathering for the aerospace and defense industry—the Paris Air Show—meeting one-on-one with corporate leaders to share my vision for the business environment we are building in Arizona. Together with the Arizona Commerce Authority, we met with more than 35 companies—all of whom have an interest in our state.
- That same month, I led a delegation of about 50 Arizona business and political leaders to Mexico City. It was the first gubernatorial trade mission in nearly a decade, kick-starting a dialogue about economic partnerships and connecting top Arizona CEOs with the likes of telecom mogul Carlos Slim, Mexico's Secretary of the Economy and dozens of Mexican CEOs.



GOV. DOUG DUCEY

- In October, I led a trade mission to Israel, meeting with Startup Nation and top industry executives in aerospace and defense, software and IT and clean tech. It was an honor to be invited by Israel's minister of the economy to be a featured speaker at the Water Technology & Environment Control conference in Tel Aviv.

The trade picture indeed looks bright.

Arizona's exports to Mexico, the United Kingdom, Germany, Thailand and China have all grown compared to last year. Fast-growing export products include semiconductors and communications equipment as well as aerospace products and parts.

Arizona's trade numbers are particularly impressive when you compare them to the rest of the country. While U.S. exports in 2015 have declined about 6 percent compared to 2014, they've increased in Arizona by 10 percent. Our state is one of only seven that have registered export growth so far this year.

We are making excellent progress in the effort to strengthen Arizona's international presence and capitalize on economic development opportunities. I will continue to help build mutually beneficial relationships with our global partners to increase trade and ensure Arizona's businesses thrive at home—and abroad. 🇺🇸

SINGLE-CELL SOLUTION

WRITING BY × JOE KULLMAN

Boosting microalgae growth for more sustainable energy

a

species of microscopic single-cell organisms could become one of the next major sources of clean, renewable energy around the world. Arizona State University researchers are now working to help make that happen.

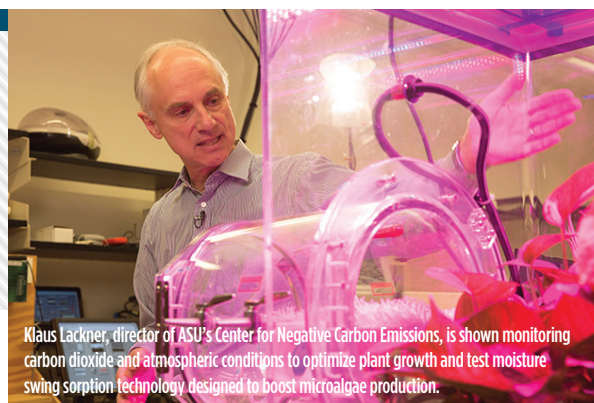
The U.S. Department of Energy recently awarded ASU a \$1 million grant to fund the Atmospheric Carbon Dioxide (CO₂) Capture and Membrane Delivery project aimed at enabling more large-scale cultivation of microalgae.

Microalgae exist in fresh water and sea environments, and can be used to make biofuels and an array of consumer products with only the addition of sunlight and CO₂. Besides renewable biofuels production, microalgae biomass is being used for products ranging from food supplements and feed for mammals and fish to therapeutics and cosmetics.

“Our goal is to develop systems to make growing microalgae more affordable and sustainable and to produce it on scales large enough to meet growing demands in the United States and globally,” says Bruce Rittmann, who is leading the project with Klaus Lackner.

Rittmann and Lackner are professors of civil, environmental and sustainable engineering in ASU’s Ira A. Fulton Schools of Engineering. Rittmann is director of the Swette Center for Environmental Biotechnology at ASU’s Biodesign Institute and Lackner is director of ASU’s Center for Negative Carbon Emissions.

Their centers are joining forces with researchers at ASU’s Arizona Center for Algae Technology and Innovation, and the Biodesign Institute’s Center for Applied Structural Discovery to develop the atmospheric CO₂ enrichment and delivery system. The project team is focusing on two technologies: moisture swing sorption for capturing CO₂ from the atmosphere and




JESSICA HOCHREITER/ASU

membrane carbonation for delivering the CO₂ more efficiently to microalgae.

“Current atmospheric levels of CO₂ are too low to produce high rates of microalgae growth. We want to feed the microalgae with CO₂ concentrations that are significantly higher than in the atmosphere to enable the microalgae to grow much faster,” Rittmann says. “My part of the project is about a novel way to deliver that additional CO₂ at very high efficiency.”

Microalgae grows best in the sunny, warm climate of the Southwest but the organisms need a source of concentrated CO₂ to grow. Power plant emissions are a potential source of concentrated CO₂ but power plants are not located near most good locations for growing microalgae. So capturing and delivering CO₂ directly from the air is a game changer because it allows microalgae to grow anywhere.

Lackner’s part of the project involves a new technology called moisture swing sorption, which uses a special material that, when dry, selectively adsorbs CO₂ out of the air to enrich atmospheric CO₂. When the material gets wet, it releases the CO₂ into a small volume of air so that CO₂ is at least 100 times more concentrated than it was in the ambient air. “Because atmospheric CO₂ is everywhere, our goal of linking CO₂ enrichment and delivery will enable microalgae technology to work in any sunny climate or environmental condition,” Lackner says.

For more information, see the project website at <https://sites.google.com/a/asu.edu/aced/> overview. 

JOE KULLMAN is a media relations officer for the Ira A. Fulton Schools of Engineering at Arizona State University.



HOT TOPIC

Helping critical cottonwoods thrive in climate change



Cottonwood seedlings are grown at the NAU Greenhouse as part of the Southwest Experimental Garden Array.

W

hen a tree species supports more than 1,000 animals, birds, insects and microbes, the tree type can be considered too big to fail. "Cottonwoods are the General Motors of the plant world because they define a community and an ecosystem," says Tom Whitham, Regents' professor of biological sciences at Northern Arizona University. Whitham's genetics-based research is designed to conserve cottonwoods in the face of climate change.

In the southwestern United States, Fremont cottonwoods are often the dominant trees of riparian habitats. They grow at sea level up to elevations of 6,600 feet. Although riparian habitat makes up less than 3 percent of the landscape, it is a hot spot of biodiversity and supports nearly 50 percent of the birds that nest in the region.

Analyzing cottonwoods has become part of the Southwest Experimental Garden Array, a project with multiple growing sites. Whitham, a principal investigator, says the project is creating a significant database with a goal of identifying genes responsible for plants' drought tolerance, productivity, disease resistance, water use efficiency and diversity.

"By having these plants from sites around the state, we can identify the plants that will tolerate a 3- or a 6-degree increase in temperature," Whitham says. "This allows us a very experimental way to identify the source populations that can survive future climatic conditions."

Whitham and other scientists think this

conservation strategy is especially important to keep foundation species in the landscape during climate change.

Gathering data on the natural genetic variations that exist in the wild can inform restoration decisions. When tasked with restoring an area, Whitham says replanting with local tree genotypes adapted for today's climate would likely not survive projected future climatic conditions in a rapidly changing environment.

The big data generated by the Southwest Experimental Garden Array is shared with numerous land management agencies throughout the region where the experimental forests and gardens are planted. This sharing of information is critical and time sensitive, Whitham says.

"Historically, there has been a very long lag time between basic research and implementation into management practice, and we can no longer afford to do it that way," Whitham says. "With the rates of climate change, there needs to be a seamless integration between the scientific findings and land management applications."

This practice already has been achieved in agriculture, where a similar approach has changed management practices with soil scientists, plant geneticists and climatologists working together to increase crop production. Whitham says it makes sense to apply similar principals to wildlands but with different goals of maintaining healthy ecosystems and high biodiversity. 📺

WORLD CLASS

WRITING BY × BRUCE WRIGHT AND DAVID ALLEN

Tech Launch Arizona offers a critical link for creations



In 2013, the University of Arizona (UA) created Tech Launch Arizona to bring a vision for technology commercialization to life. The Arizona Board of Regents and UA leadership understood that technological breakthroughs—both those emanating from University laboratories as well as those being developed in the business world—address societal challenges and drive economic growth.

While innovation is a natural result of University research, how can academia contribute to developing new products and moving them into the marketplace? One of their greatest opportunities lies in leveraging world-class expertise. The UA is a leading public research university with regional roots and global impact. By tapping into the University, businesses get a direct line into a hub for learning, knowledge creation and innovation—a place of boundless possibilities.

Technology development plays an essential role in the economic prosperity of our region, and the UA supports new technology businesses and trade opportunities to foster this growth.

Through commercialization, Tech Launch Arizona (TLA) creates social and economic impact through bringing the inventions of the UA from the lab to the world. New technology companies heading into the market move much faster with more resources at hand to help them start smarter. They have support from TLA's internal business and technology experts, its network of over 1,300 volunteer domain experts, a team of executives and entrepreneurs in residence, a robust asset development program, and its own technology research parks, Tech Parks Arizona.


Along with providing world-class office space as well as wet and dry lab space for product

development, the Tech Parks has developed its Global Advantage business assistance program to provide solutions for innovators, startups, and small and medium-sized enterprises as well as large multinational corporations. The program offers companies a competitive advantage through market access, product development, manufacturing assistance and business development.

This innovative partnership leverages the benefits and assets of several trusted business partners. When companies go through the Global Advantage program, they become part of an interconnected network that capitalizes on the business expertise and core competencies of each organization.

The UA also supports the Southern Arizona trade corridor through a variety of initiatives such as Innovation Frontier Southwest (IFS), a regional coalition of organizations collaborating to develop and promote advanced manufacturing in the security and defense industry. The consortium is working to develop new manufacturing capabilities in the region while growing existing opportunities. In addition, IFS is training and credentialing the workforce required to support such industry.

The UA is also linked to the state's Transportation and Trade Corridor Alliance, which builds on the strong economic base of Arizona. The UA plays a significant role in technology development by using the transportation system as the means of connecting Arizona to global markets, which moves the economy towards a future focused on high-value trade and investment.

When the UA opened in 1885 as a land-grant university, one of its primary roles was to help the state's population respond to the changing economic landscape created by the industrial revolution. Today, the revolution lies in the world of high-tech innovation but the University's role, albeit adapted to fit today's needs, remains consistent. Fostering new technologies, growing new businesses, supporting workforce development and leading organized regional economic development strategies remain—and will continue to be—core to the UA mission. 

BRUCE WRIGHT is associate vice president for Tech Parks Arizona and **DAVID ALLEN** is vice president of Tech Launch Arizona.



Dr. Bodour Salhia



AN END TO BREAST CANCER DEATHS?

WRITING BY × STEVE YOZWIAK

New TGen research may predict patients' future, answer questions

you have breast cancer but it's in its early stages. You've had surgery. You've had radiation treatment. You've had chemotherapy. There is a good chance that your cancer will not return but your doctor cannot tell you that with certainty.

And while treatments have vastly improved in recent years for the more than 234,000 American women who develop breast cancer annually, it remains impossible to tell—even for the most treatable types of the disease—whether the cancer will remain in remission, return to the original site, or, worse, mutate and spread to a distant organ such as the liver, lungs or brain. It is this spreading, or metastasis, that is responsible for most of the nearly 41,000 annual breast cancer-related deaths in the U.S.

The results of a recent study led by Dr. Bodour Salhia, an assistant professor at the Phoenix-based, non-profit Translational Genomics Research Institute (TGen), may soon tip the scales in favor of the patient by removing much of the guesswork when predicting a risk of recurrence.

Salhia and her colleagues identified 21 DNA hypermethylation hotspots, or gene locations along an individual's 3 billion chemical bases of DNA, with increased levels of methylation that could indicate the existence of metastatic breast cancer. These findings could lead to a highly sensitive, blood-based test panel (a type of liquid biopsy) that could help predict relapse in women with breast cancer.

This 21-gene signature is a potential biomarker that could indicate patients who are at high risk of cancer recurrence either in the breast or elsewhere in the body, and who might benefit from additional therapy to eliminate the potential of recurrence. Biomarkers are indicator molecules such as proteins or DNA that are measurable in blood, body fluids or tissue samples, and can be

used to diagnose or measure a particular disease or the effects of a given treatment.

"Once therapy is completed, women—and their oncologists—often still don't know what their risk of recurrence is," Salhia says. "Because we are able to detect a unique signature in metastatic breast cancer patients that doesn't exist in healthy individuals or in patients who have been in remission for many years, we want to use this information to develop a test that will help physicians more accurately address this question."

This test would rely on TGen's mastery of gene sequencing and follows TGen's growing efforts to create methods of early cancer detection.

"The idea is to take the 21-gene signature that we associated with metastatic breast cancer in the blood of these women and develop it into a predictive marker that we can use when women still have early stage breast cancer, so well before metastatic disease becomes symptomatic and a clinical dilemma," Salhia says.

The research discovery offers significant promise for all breast cancer patients in the future. It could provide physicians with critical information about the need for additional therapies, especially following surgery or sessions of chemotherapy.

"To be able to detect cancer in the blood, to be able to predict in which patients the cancer will recur, that would be fantastic," Salhia says. "If we can do that, then we could really try to eradicate the mortality associated with breast cancer. I think this kind of precision diagnostics is going to be so critical to improving the overall outcomes for breast cancer patients." 📱

STEVE YOZWIAK is the senior science writer for the Translational Genomics Research Institute.

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CYBERSECURITY SUMMIT

THURSDAY, MAY 5, 2016

The Arizona Technology Council (AZTC), Arizona Commerce Authority (ACA) and the Arizona Cyber Threat Response Alliance/Arizona Infragard (ACTRA) present the third annual Cybersecurity Summit on Thursday, May 5, 2016. The Cybersecurity Summit is an opportunity for government and business executives to learn about the threats, vulnerabilities and consequences related to data security and privacy matters.

Join us for this educational summit that provides actionable solutions, as numerous AZTC and ACTRA member organizations showcase their available resources, products and services geared toward helping protect your intellectual property and customer data. There will be a panel discussion, keynote speaker, sponsor expo and other exceptional presentations.

DATE AND TIME:

Thursday, May 5, 2016
12:30pm - 6:30pm

LOCATION:

Scottsdale Hilton Resort
6333 North Scottsdale Rd
Scottsdale, AZ 85250

AZTC/ACTRA MEMBER: \$50 | NON-MEMBER: \$75

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