Oro Valley Report
Activity for the Period
July 1-September 30, 2010

1) **Retention, expansion and attraction of primary employers**

Strategies:

- Support local company formation as a method to create jobs and capital investment as well as showcase the Tucson region's innovative strengths.
- Conduct 3 Economic Development missions/trips to showcase the Tucson region's competitive strengths.

  Activity:
  - TREO is working with other organizations and Oro Valley on medical device effort, as well as an aerospace/defense focused effort.

- Publish/sponsor 15 media articles showcasing the Tucson region's competitive strengths.

  Activity: (Articles attached)
  - Profiled the region to 2500 corporate site selectors via "Select Tucson".
  - Business Expansion Journal (Tucson / solar zone inclusion in cover story)
  - Business Facilities magazine (Tucson / solar zone inclusion in cover story and annual rankings report).
  - Canada's BioBusiness.

- Conduct 4 outreach meetings with regional primary employers to discuss current and future issues associated with operations, workforce, sales, local government, and other important matters. These meetings will focus on businesses within the four targeted industries and primary employers which produce goods and services in excess of what can be consumed by the local market.

  Activity:
  - Meetings were conducted with representatives of Ventana Medical Systems during the period July – Sept 2010. Interaction with VMSI continues as we work to implement the agreements supporting the firm's expansion in Oro Valley.
  - Solon Solar, Meeting held October 29, 2010.

- Attract and assist businesses outside of our community to relocate into the region and create new jobs. TREO shall focus on companies within the four targeted industries. Host 2 site selectors in Oro Valley.

Activity:

- Hosted Ginovus Partners in Oro Valley.
- Pipeline Prospects Include:
  - 42 Prospects & Clients Total
  - 3 Aerospace/Defense
  - 12 Alternative Energy
  - 10 Bioscience
  - 3 Call Center
  - 14 Other

2) Economic Development Policy and Tools development and pursuit

Strategies:

- Pursue reinstatement of State Job incentive grant funds.
- Enhance and standardize the State enterprise zone program for use in relocation of primary employers.

Activity:

- TREO participated in the statewide effort to draft a comprehensive economic development tools white paper through out the reporting period. Participants included representatives of the Governor's office and the Arizona Commerce Authority, Arizona Association for Economic Development, and rural economic development practitioners. The resulting white paper outlines options for possible tools including:
  - Enterprise Zone enhancements
  - Protection of Job Training Funds
  - Establishment of closing fund
- A Joint Legislative Preview with Tucson Metropolitan Chamber of Commerce and Southern Arizona Leadership Council - Pursuant to the TREO board's goal of increased collaboration with other business groups in the region, has been planned for mid-December. The objective of the gathering is to present a unified and concise set of recommendations to the delegation of state legislators representing Southern Arizona in Phoenix. Likely items include the need for a jobs bill and related economic development tools necessary to contribute to Arizona's competitiveness moving forward.

3) Marketing and promotion of the Tucson Region as a Business Center

Strategies:

- Continue national public relations outreach to position TREO as a business center by conducting 2 press trips, one out-bound and one in-bound.

Activity:

- As part of our national marketing campaign, TREO hosted national

and international reporters to profile the aerospace and defense industry and specific companies in Southern Arizona. Six reporters participated, representing a variety of publications on September 30th and October 1st. 3 stories resulted from this effort. (See Section 1)

- Generate positive local media coverage in business publication, TV and radio regarding the Tucson region's key strengths. Working with local media partners to highlight at least 2 positive stories that demonstrate the region's support of the business community and job creation.

  Activity:
  - Planned program/content for TREO Annual Luncheon on October 1st, featuring Admiral Mike Mullen, Chairman of the Joint Chiefs of Staff. This was largest luncheon in TREO's history, with attendance of 780 and major regional employers represented. Coordinated local media interviews celebrating TREO's success.

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American Red Cross to consolidate blood donor call center, bring 300 new jobs to Tucson

Tucson "The Solar City" Featured in Business Facilities Magazine April 2010 Cover Story

ADVANCE Magazine Notes Growth of Southern Arizona Bioscience Industry

Why Tucson for Aerospace?

Tucson's clear blue skies and dry climate have been attracting aerospace-related attention since the early 1900s. Year-round testing of equipment and aircraft provide a clear value to the region's 200+ aerospace and defense companies..

Nationwide, Tucson ranks as one of the Top 5 metro markets for its concentration of employment in aerospace and defense. Major employers such as Raytheon Missile Systems, Lockheed Martin, Bombardier Aerospace, Northrop Grumman, Honeywell Aerospace, and the expanding Sargent Aerospace & Defense (see story below) continue to thrive in the Tucson area, generating $5 to $6 billion annually.

One of the primary reasons for the success of these companies is the quality workforce available in Southern Arizona. From aerospace engineers graduating from the University of Arizona, to FAA-certified airframe technicians trained at the nationally-renowned Aviation Technology Center at Pima Community College, Tucson has the educational resources to supply all levels of aerospace workers to companies in the region. Throughout Southern Arizona, there are currently between 20,000 and 30,000 people employed in the aerospace industry.

For more information on locating or expanding in the Tucson region, please contact:

Lee Smith
Sr. Vice President, Business Development
520.243.1909 or lee.smith@treoaz.org

AEROSPACE INDUSTRY NEWS

Sargent Aerospace & Defense Announces Major Expansion, Doubling Size of Southern Arizona Facility

Sargent Aerospace & Defense, a leading supplier of precision engineered components and aftermarket services, and an operating company within Dover Corporation's (NYSE: DOV) Industrial Products Segment, announced that it has chosen the Tucson region to expand and upgrade its operations in support of current and projected business growth.

The company, part of the greater Tucson region since 1990 and currently employing approximately 250 people, will build a projected 70,000 square-foot

Get expanded information on these Tucson industries:

Aerospace

Bioscience

Solar

Transportation & Logistics

Read the Latest Relocation & Expansion News from Tucson

Newsweek ranks Tucson's BASIS Charter School #6 on its Best American High Schools list (June 2010)

Forbes ranks Tucson as one of America's Most Innovative Cities (May 2010)

Forbes ranks Tucson as the 8th Best City for Commuters (February 2010)

Sunset ranks Tucson as one of its "20 Best Towns of the

facility adjacent to its existing 60,000 square-foot facility . With the new campus, Sargent will implement an engineering design and qualification lab center of excellence, while incorporating operational improvements and environmentally responsible building elements.

The increased capacity is required to support the growth of key programs such as the VIRGINIA class submarine, the new Boeing 787 and Airbus A350 commercial aircraft, and Lockheed Martin's F-35 Joint Strike Fighter.

Sargent anticipates this growth, coupled with new development activity, will add new jobs in the areas of specialty aerospace design, manufacturing, test engineering, program management, and highly-skilled manufacturing such as computed numerically controlled (CNC) machine programmers, operators, and test technicians.

"Our decision to expand in the greater Tucson region, specifically Marana, was driven by a need to retain a strategic location with a culturally diverse employment base. Being close to California and Mexico allows us access to both key aerospace suppliers and our existing manufacturing plants via a well-established transportation network. Southern Arizona provides long-term value while maximizing productivity and supporting our growth plans," said Scott Still, president, Sargent Aerospace & Defense.

"This was a very competitive site selection process and is now another feather in the hat for the Tucson region. We are a Top 5 Metro area nationwide for aerospace & defense, and Sargent has chosen the best place to grow and prosper for many years to come," said Joe Snell, president & CEO, TREO.

BUSINESS EXPANSION NEWS

Arizona Canning Company Announces Expansion, Brand Acquisition

Tucson-based food manufacturer Arizona Canning Company has purchased the Luck's brand from ConAgra Foods to complement its line of canned foods produced in Southern Arizona.

Arizona Canning Company, which selected Tucson for its U.S. operations in 2006, will sell, source raw material, produce, warehouse and fulfill customer orders of the Luck's brand directly from Tucson across the U.S. The brand acquisition will add 40 jobs in the Tucson region, bringing the projected plant workforce to 134. The additional jobs will be in production, maintenance, logistics, quality assurance and engineering.

In addition, Arizona Canning Company has added 92,000 square feet of dry warehouse space in preparation for the growth, bringing the total square footage to 532,000. The addition of the Luck's brand of products results in the Arizona Canning Company plant running 24 hours a day/5 days per week, or at near capacity. The purchase of Luck's will also allow a major expansion of the La Costeña-owned U.S. headquarters into Mid South/ Southeast markets and the ability to maximize the brand's potential by adding it to the La Costeña product portfolio. Arizona Canning Company currently

Future," specifically noting Tucson's innovative building movement and environmentally responsible architecture (March 2010)

Best Place in Arizona to Raise Your Kids *Business Week* (November 17,2009)

An Editors' Choice for cities that are surviving and thriving during the economic downturn - *Business Facilities* magazine (October 2009)

No. 6 of the Top 10 Metro Areas for aerospace/defense manufacturing. *Business Facilities* magazine (August 2009)

No. 16 Best City to Live and Work for Young Professionals (Next Generation Consulting, June 2009)

Among the top 12 "Fast Cities" worldwide by *Fast Company* magazine (May 2009)

Tucson named a "rising biotechnology star of Arizona" *Business Facilities* magazine. (March 2008)

Fast Company magazine named Tucson among the top 10 in the United States for job growth and high-tech industry concentration. Noted "Fast Companies" are Raytheon Missile

manufactures canned foods including refried beans, whole beans and enchilada sauces, under licensed brands such as La Costeña and SunVista.

Click here to read more about Arizona Canning Company.

BUSINESS EXPANSION NEWS

American Red Cross to Consolidate Blood Donor Call Center, Bring 300 New Jobs to Tucson

The American Red Cross has plans to consolidate its blood donor call center operations to three locations across the country, including a facility which will bring approximately 300 new jobs to the Tucson, Arizona area.

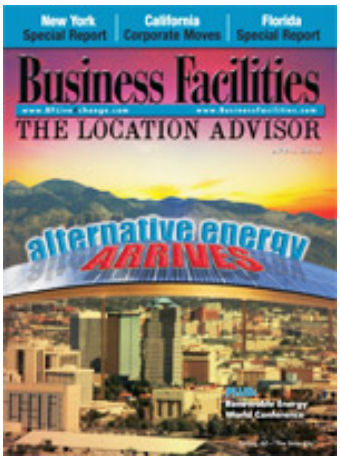
The Tucson facility is expected to open this summer. Red Cross telerecruitment efforts are currently conducted in blood centers across the organization, and the organization plans to relocate these operations to the three new locations. Telerecruiters contact donors to schedule appointments to give blood and provide reminder calls to individuals scheduled to donate.

In selecting Tucson, the Red Cross identified a number of criteria including the availability of skilled labor, the availability and cost of facilities, and any economic incentives offered by the city.

SOLAR INDUSTRY NEWS

Tucson "The Solar City" Featured in Business Facilities Magazine April 2010 Cover Story

Tucson is prominently featured in the April 2010 issue of Business Facilities magazine, including many photos of the companies and facilities involved in the solar industry across the city.



From the cover images of the city beneath a canopy of solar panels, to the editors introduction, to the feature article, Business Facilities -- a leading publication for site selectors who aid in business relocation and expansion nationwide -- shows how Tucson is establishing itself as a location of choice for the solar industry.

Get the complete article below:

Click here to download the complete article (pdf)

Systems, UniSource Energy,
and Universal Avionics.
(July 2007)

Tucson ranked #27 for job growth and #49 for business and careers in *Forbes'* list of best places among the nation's 200 largest cities.
(March 2008)

Click here for more Tucson rankings

BIOSCIENCE INDUSTRY NEWS

ADVANCE Magazine Notes Growth of Southern Arizona Bioscience Industry

ADVANCE is a monthly publication that reaches decision makers employed in hospital-based and reference laboratories, as well as physician office laboratories.

For this article, the magazine focuses on Southern Arizona's existing bioscience industry -- companies like Roche and sanfi-aventis -- and notes the region's ability to incubate new bioscience companies through facilities such as the Bio5 Institute, University of Arizona TechPark and the University's new bioscience park.

Click here for the article.

If you have feedback on the newsletter or would like to provide an idea for a future article, please contact chance.agrella@treoaz.org or (520) 243-1917

FOLLOW TREO ON:

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120 North Stone Ave., Suite 200, Tucson AZ, 85701
Call 866.600.0331 or visit www.treoaz.org

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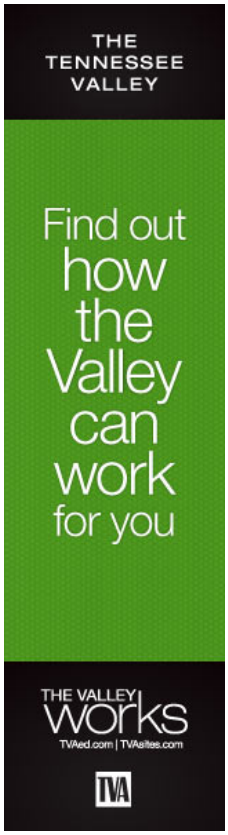

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Solar Energy Is The Economy's Bright Spot

« Back

by Rachel Duran

The solar energy industry in the United States is red hot, and has become a significant part of the country's energy mix, thanks to a number of pieces coming together at the right time. This includes federal grant programs and tax credits, state-level incentives, and a 40 percent decrease in the wholesale price of solar, which spanned the summer of 2008 through the end of 2009.

As a result of these favorable factors, solar markets are developing in every state, where just a few years ago, the industry was isolated to a few states. New Jersey installed 57 megawatts of solar energy in 2009, second to California, which installed more than 220 megawatts. New Jersey's officials have turned to solar to overcome the difficulties the state has in building new power plants and new transmission lines, supported by favorable policies and incentives to encourage growth.

The growth in the residential installations of solar products, as well as the increase in utility-scale applications, signifies the diversity of products and technologies available in the marketplace. These increases contributed to a 38 percent growth rate of the industry in 2009, and an increase in revenue of more than 40 percent.

What's more, the expansion of the industry not only created 17,000 new jobs in 2009, but it also put roofers, plumbers, and electricians from the hard-hit housing industry back to work. The industry currently needs and will need accountants, lawyers, and manufacturers, among other skill sets to keep pace with growth.

It is because of the surge in the U.S. marketplace for solar-related activities that German firm Flabeg decided to build a plant for solar mirrors used in concentrated solar power applications in the United States. The mirrors are used in industrial-scale power stations, generating heat which is transferred to steam, which is then transferred to electric energy.

Flabeg Solar US Corp. located to Findlay Township, Pa., part of the Pittsburgh metro region. The key element in the decision-making process was timing. “We had a lot of obligations to deliver mirrors so we had a very demanding time line for this project,” says Jochen Meyer, president, Flabeg Solar US. “We wanted to be ready for production by the end of 2009.”

Meyer’s team found a shovel-ready site that allowed the firm to begin operations in a swift manner. “We found readily available, pre-developed sites at an airport industrial park, which was developed by the airport authority, and which offered excellent logistics positioning to the airport and highway access,” Meyer says.

Flabeg's officials also had existing relationships with local authorities in the area because its has an auto mirror plant located in Brackenridge, Pa. Additionally, the Pittsburgh region allowed the firm to operate from the East Coast, which provided a larger shared window of time with its German office, working from a six-hour time difference to support the management of a global company.

Flabeg's Findlay Township site is a 230,000-square-foot facility, which is home to 50 workers, expecting to add 50 more by the end of the year. “We have a substantial investment project going on next year, and we expect the U.S. market to really get going,” Meyer adds, which will increase the company's employment numbers to 300.

Learning A Thing Or Two From The Veterans

European and Scandinavian countries have long been global leaders in developing and using renewable energy technologies, supported by many factors, including favorable regulatory policies to grow the sectors. In regard to solar energy activities, “the irony of ironies is that Germany is by far the largest market in the world; they sell as much as eight times as we do in the United States,” says Rhone Resch, president and CEO, Solar Energy Industries Association, which works to expand the industry through a variety of initiatives. “Yet, the amount of sunlight that falls in Germany is equivalent to the amount of sunlight we have in Anchorage, Alaska. So the good news is that all 50 states in the United States can benefit from the greater use of solar energy.”

A company in Madison, Miss., has seen the light in regard to the benefits of solar energy. Kight Energy LLC started operations last fall conducting energy audits, aiming to expand into the solar energy industry. Through an introduction made by the Scandinavian American Economic Development Alliance (also located in Madison), officials contacted a liaison in Sweden. “He suggested that because the U.N. Climate Change Conference was taking place in Copenhagen in December [2009], we should attend and meet companies that had products in line with what we wanted to do,” says Robie Kight, P.E., president and CEO, Kight Energy. The liaison has a network of 3,000 clean-tech companies located throughout Scandinavia.

In addition to meeting with companies to discuss bringing their technologies and promoting their products in the United States, Kight and his team were given a tour of Malmo in southern Sweden, allowing them to witness first hand a mature clean-tech energy industry. They saw solar panel installations in hospitals, public works buildings, apartments and restaurants. As a result of the trip, Kight Energy signed distribution agreements with four Scandinavia companies. One company, SolarVenti, based in Denmark, manufactures solar air collectors (dehumidifiers). “Our agreement with SolarVenti is a two-step process; to develop a distribution network for their product in the United States; and at some point to begin either manufacturing or assembling the final product here in the United States,” says Alan Crancer, vice president of marketing, Kight Energy.

In August, a Scandinavia delegation of clean-tech companies toured communities in the Southeast, including Madison, to learn about further market opportunities for their products.

The solar energy industry is increasingly interested in the Southeastern marketplace, backed by state and local governments who support the projects with incentives and other resources. For example, in the spring, Twin Creeks Technologies Inc., a venture-backed solar tech company based in San Jose, Calif., announced it would locate a solar panel manufacturing plant in Senatobia, Miss. The state of Mississippi provided loan assistance totaling $50 million through its Major Economic Impact Authority to the company. The state and city will also provide $4 million to support infrastructure improvements at the site.

Twin Creeks Technologies' new 250,000-square-foot facility will feature manufacturing processes using proprietary technology in the production of photovoltaic solar panels. The company, which has engineering and manufacturing locations in Boston and San Jose, plans to create 512 jobs in two phases during the next five years, investing $175 million.

Solar-energy companies are also attracted to the business climate in Tennessee, a state which has seen more than $2 billion in solar-related investments in the past two years. Officials have passed favorable incentives to support industry activities. The solar-energy sector is anchored by $1 billion plant announcements (each) from Hemlock Semiconductor in Clarksville, and Wacker Chemie, AG in Clinton, which will manufacture polycrystalline silicon, a key component in photovoltaic products. In further developments to Tennessee's supply chain for the solar energy industry, Confluence Solar Inc. announced in January it would produce mono-crystal silicon ingots for photovoltaic solar power generation from a $200 million operation in Clinton. "Tennessee's nationally recognized business climate and their focused solar strategy along with Clinton's proximity to Oak Ridge National Laboratory and the new Solar Institute made Tennessee the perfect location for our facility," said Tom Cadwell, CEO and co-founder, Confluence Solar, at the time of the announcement.

In the Southwest United States, supply chain synergies are thriving in Tucson, Ariz.'s solar energy cluster. Two Germany companies have discovered the advantages of the state and local community's support for the industry in the form of incentives and policies mandating solar energy applications.

Solon Corp., one of the largest solar module manufacturers in Europe; and Schletter Inc. a designer, manufacturer, and distributor of solar systems, have both opened their only U.S. facilities in Tucson.

Global Solar Energy, a manufacturer of thin-film solar on flexible substrates, supplies Solon from its Tucson headquarters. The company opened two facilities in Tucson in 2008. Global Solar Energy and Solon have installed the largest array of a copper indium gallium selenide solar field in the country, where the 750 kilowatts generated help to power Global Solar Energy's operations.

Another member of the supply chain is General Plasma, which manufactures the machines that Global Solar Energy uses to make its thin-film technology. Another player is Prism Solar Technologies Inc., which is a startup whose technology concentrates more sunlight on to solar panels.

In Tucson, companies find a unified voice in support of the solar-energy industry, says Laura Shaw, senior vice president, marketing and communications, Tucson Regional Economic Opportunities, Inc. (TREO). "We have people that are working from the same strategic plans," Shaw says. "For example, the Greater Tucson Solar Development Plan was driven by our Association of Governments. And TREO also has a solar and alternative energy industries strategy in our Economic Blueprint. The community works in concert with each other."

And while many communities want to develop a solar industry to tout to companies for business investment, do they really have the strengths and assets to deliver to the industry? Shaw asks. In addition to the sun, Tucson has demand for the market due to the state's renewable energy requirements that must be met; a university with strong engineering and R&D programs, competitive operating costs; and access to a tech workforce.

The University of Arizona is home to the Arizona Research Institute for Solar Energy (AzRise), a global institute that creates partnerships among stakeholders to promote the growth of solar energy in the state. What's more, part of the university's tech park is designated as the Solar Zone, which consists of 200 acres set aside in order to house solar companies, such as those involved in generation and storage, manufacturing and assembly and R&D.

The anchor tenant of the Solar Zone is Bell Independent Power Corp. (BIPC), based in Rochester, N.Y., which will conduct a commercial demonstration of its proprietary thermal storage system. The technology has the ability to improve the efficiency of a facility by 50 percent, which will drive down the costs of producing solar power. BIPC is developing a 5-megawatt solar plant featuring a thermal storage system for concentrated solar power that will be the first-of-its-kind in the world. The $32 million project will feature 45 acres of parabolic solar mirrors to capture the solar energy. The project will begin providing power to Tucson Electric Power's customers in May of 2011.

BIPC's activities figure into the bigger picture of the U.S. solar energy, which will continue robust growth for years to come. "In 2009, we installed a little less than 500 megawatts [of solar energy]," Resch says. "By 2015, we will be installing more than 10,000 megawatts each year. That is enough electricity for 2 million new homes to be entirely powered by solar power. There is no other industry out there that will experience this growth."

For complete details about the organizations featured in this article, visit:

Flabeg Solar US Corp., www.flabeg.com

Kight Energy LLC, www.kightenergy.com

Solar Energy Industries Association, www.seia.org

Tennessee Department of Economic and Community Development, www.tn.gov/ecd

Tucson (Ariz.) Regional Economic Opportunities, Inc., www.treoaz.org

Alternative Energy*

Based on number of establishments, first quarter 2008 to first quarter 2009.

Startups

1. California

2. Florida

3. Texas

4. New York

5. Arizona (Tie)

5. Pennsylvania (Tie)

7. Colorado (Tie)

7. Illinois (Tie)

9. North Carolina (Tie)

9. Massachusetts (Tie)

New Branches

1. California

2. Texas (Tie)

2. Arizona (Tie)

4. Connecticut (Tie)

4. Illinois (Tie)

4. Colorado (Tie)

4. Massachusetts (Tie)

4. Michigan (Tie)

4. Mississippi (Tie)

4. Missouri (Tie)

4. Iowa (Tie)

Employment

1. California

2. New York

3. Texas

4. Florida

5. Massachusetts

6. New Jersey

7. Maryland

8. South Dakota

9. Iowa

10. Pennsylvania

* There isn't a comprehensive way to rank the alternative energy sector; rankings are based on the information that is available in the marketplace.

Data includes the following classifications:

44-621.9909 Windmills, electric generating

43-869.0104 Ethyl alcohol, ethanol

43.869.0108 Methyl alcohol, synthetic methanol

43.869.0306 Ethanolamines

32-711.0403 Solar energy contractor

32.742.0204 Solar reflecting insulation film

44-433.9904 Solar heaters and collectors

44-674.0305 Photovoltaic devices

44-674.0306 Solar cells

44-829.0218 Solarimeters

86-074.0208 Heating equipment and panels, solar

96-211.0300 Insulation and energy conservation products

Source: BizMiner, www.bizminer.com, develops more than 5 million online Industry Marketing Research and Industry Financial Profiles by tracking the actual experience of 18 million individual firms and branch facilities in its databases, and then aggregates them by industry, area and other characteristics.

Since 1990, BizMiner has built its reputation on quality research in the fields of economic and business development. The company creates market trend and financial analysis reports on more than 16,000 lines of business in every U.S. county, MSA and state. Measures include sales trends, market volume, business failure, entrepreneurial activity, new branch attraction, return and other financial ratios.

Cleveland's Advanced Energy District Encourages "Going Green"

By the end of the year, projects will be up and running under the Cleveland area's Advanced Energy Special Improvement District. The new district allows any commercial property owner to finance the costs of installing and operating energy efficiency systems through their property taxes, says Nathan Kelly, director of economic development for the city of Lakewood, and the spokesperson for the First Suburbs Development Council. The financing supports the installation of solar panels, wind turbines, geothermal, biomass — any renewable energy initiatives that can be used to reduce the costs of energy usage. Property owners repay the financing over 20 years.

First Suburbs Development Council markets the 16 suburbs of Cleveland. These cities, and the city of Cleveland, have passed legislation that allows them to participate in the special improvement district. Kelly says at this time incumbent industry is particularly interested in the new district. "If you are going to make a significant investment in energy efficiency, oftentimes people look for new space," Kelly says. "In cities like Cleveland we do not have a lot of new space so people have to move farther away. This provides the benefit of upgrading that other areas can't provide."

Additionally, among the new businesses that move to the region to capture the benefits of the district are "green" companies. "They install or manufacture these products because they want to demonstrate their commitment to green technologies, but they also realize the financial benefits of the products in these geographies because of the special improvement district," Kelly says.

For complete details about Cleveland's Advanced Energy Special Improvement District, visit www.fscdc.org.

Southern Cal Edison Delivers The Nation's Most Renewable Energy

In 2009, Southern California Edison (SCE) delivered 13.6 billion kilowatt hours of renewable energy, which comprises 17 percent of its energy portfolio. The company has 4.9 million customer accounts, spanning a 50,000-square-mile service area.

To put this renewable energy delivery in perspective, it is important to look at volume, says Laura Genao, an attorney with SCE. "We buy about 50 percent of California's statewide renewables total. We are doing a lot of activity in terms of signing up the efficient and effective renewables in the state."

This includes the announcement in July that SCE awarded 36 contracts to independent power producers for a total of nearly 60 megawatts from photovoltaic solar that will be installed on 31 unused rooftops and five ground-mount sites in the utility's territory. The activities are part of a program that will result in 500 megawatts of solar power generation that will be installed on unused rooftops. SCE will own and operate 250 megawatts under this program; the remaining 250 megawatts will be owned and operated by independent power producers.

In other solar-related initiatives, SCE has negotiated one of the world's largest projects, where seven projects will provide up to 1,300 megawatts of solar thermal energy. Production will begin in San Bernardino County in 2013.

A large part of SCE's renewable energy strategy is ensuring the delivery of all this power, says Barry Gilman, manager of the renewable and alternative power department, SCE.

For example, the main line serving the Tehachapi renewable transmission project is complete. The project aims to develop 4,500 megawatts of wind and solar resources to serve SCE's territory, Genao notes. "We have other projects in the study and planning stages for additional transmission," Gilman says. "We are in various stages in preparation for the future."

For complete details about SCE's solar energy and renewable energy portfolio, visit www.sce.com/renewables.

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Alternative Energy Powers the New Economy

Locations across the country have made renewable energy central to their economic recovery strategies. The race is on to claim a leadership position in solar, wind, geothermal and biofuel generation and manufacturing.

By Ed Felton

Despite the economic downturn, the three benchmark energy technologies—solar, biofuels and wind—grew in global revenue by 11 percent in 2009, totaling $139.1 billion, and they are projected to grow to $325.9 billion within a decade. They are part of a renewable energy industry that has come to be more than just a sign of hope—it is now the driving force for economic recovery.

According to a report issued in March by Clean Edge Inc., a research and publishing firm for the clean-tech sector, biofuels and wind power each saw increased revenue last year, though solar experienced its first decrease due to a decline in solar PV pricing. While total venture activity was down in the U.S. in 2009, clean energy ventures increased to 12.5 percent of total venture activity. The firm's research shows that wind power, with global installations reaching 37,500 megawatts last year, will expand from $63.5 billion in 2009 to $114.5 billion in 2019.

The biofuels market, consisting of more than 23.6 billion gallons of ethanol and biodiesel production worldwide, reached $44.9 billion in 2009 and is projected to grow to $112.5 billion by 2019. And solar PV, including modules, components and installation, will grow from a $30.7 billion industry to $98.9 billion by 2019, according to Clean Edge projections. Wind energy is of particular note, as it is the fastest growing energy source in the world.

The installation of nearly 10,000 megawatts of new generating capacity last year, enough to serve more than 2.4 million homes, broke all previous records, thanks in part to federal stimulus dollars. Recovery Act funding spurred the growth

PHOTO: DIGITAL VISION

Artist's renderings of the SolarZone@UATechPark

of construction, operations and maintenance, as well as management jobs. But according to the American Wind Energy Association (AWEA), the U.S. is barely tapping this resource. Current wind installed capacity is at 35 gigawatts, whereas onshore U.S. wind resources could generate nearly 37 million gigawatts, more than nine times the country's current electricity consumption. With the federal government providing billions in tax breaks for renewable projects, and many states spurring development through tax incentives and the establishment of renewable energy standards, clean energy has generated huge momentum.

Here is an in-depth look at some of the locations that are staking a claim to alternative energy leadership.

Arizona Enters The Solar Zone

Southern Arizona—with its abundance of sunlight, availability of land, talented workforce, connection to University assets and regional commitment to solar and other renewable energy—has the potential to become a global leader in the future of clean energy technologies. The University of Arizona Science and Technology Park (UA Tech Park) is developing a comprehensive solar business zone within the park to capture the economic upside of the growing solar industry. This initiative is called SolarZone@TheUATechPark.

"SolarZone@TheUATechPark is a revolutionary, solar-centric business zone poised to significantly advance solar energy innovation and production. The Solar Zone thrusts Southern Arizona into the center of solar investment," says John Grabo, Director of Business Development at the UA Tech Park.

The SolarZone is a sweeping integration of power generation, solar research and development, manufacturing, green job training, education and public awareness dedicated to the creation of a competitive environment for companies in the sector to roll out current and create next generation new energy products, attract key suppliers and talent in order to promote industry success and advancement.

The SolarZone@TheUATechPark offers the ideal setting and several attributes not available elsewhere. These strategic advantages include:

- **Location**—200 acres will cluster multiple solar generation technologies, combined with next generation product development.
- **Synergy**—Centralizing key suppliers in SolarZone the region will provide a full ecosystem of resources proximate to solar operations.
- **Speed to Marketplace**—The SolarZone's streamlined development processes combined with an understanding of the competitive challenges and demands helps drive solar companies to operation much faster than any other location option.
- **Talent**—The next generation of solar energy professionals is being developed in collaboration with industry requirements at the University of Arizona and Pima County Community College.
- **Innovative Capacity**—The SolarZone is linked to the University of Arizona, is ranked among the top 20 of public research universities nationwide, and its solar efforts such as the Arizona Research Institute for Solar Energy (AzRISE) and programs in the Optical Sciences, Engineering, Atmospheric Sciences and Physical Sciences. These innovative resources will be at the leading edge of product development, testing and commercialization.
- **Entrepreneurship**—Leveraging the Arizona Center for Innovation, the potential to grow Arizona's newest renewable energy firms is enhanced by co-locating emerging and mature firms at the SolarZone. New firms add to the pipeline of new capacity for the sector.
- **Global Connectivity**—The SolarZone takes advantage of unique economic relationships with partner regions and institutions in Ottawa, Canada and Berlin, Germany who are co-advancing a

Clean-Tech initiative to develop this industry sector across international borders. This tri-partite network of cities will leverage educational, industrial and innovation linkages to increase commerce between regions in solar and other related sectors.

The SolarZone, a 200 acre site that can support nearly 20MW of solar generation, will contribute significant value to the region economically and environmentally. Five key components of SolarZone@TheUA Tech Park include:

- **Generation/Storage**—Suitable for multiple generation technologies that will serve local energy demand through Tucson Electric Power.
- **Manufacturing/Assembly**—Designed for manufacturers of solar power panels, solar cells, module assembly, systems integration and assembly, concentrators, frames, etc.
- **Research & Development**—The SolarZone is aligned with one of the priority research areas of the University of Arizona. Companies can leverage the UA's Arizona Research Institute for Solar Energy (AzRISE) and other key colleges and departments like Engineering, Optics, Science (chemistry and atmospheric science for instance), and Biosphere II for investigation and development of next generation solar technology.
- **Workforce Development**—The clustering of solar firms can lead to the development of green job training programs for the solar industry (technicians, installers, etc.). With curriculum input from industry, the region can ensure readily available talent for green jobs within the community.
- **Public Awareness/Education Center**—The demonstration center will showcase how solar energy works, how it can be used, and how it helps our environment. The center will also increase public interest and awareness of solar energy. Students will be able to work hands on with industry to learn real world application and problem solving for renewable energy companies.

The Solar Zone's first-of-its-kind integration attracted Bell Independent Power Corporation (BIPC) of Rochester, NY, which announced in January 2010 that it would be the anchor tenant of the Solar Zone with its state-of-the-art 5-MW Concentrated Solar Power plant with a Thermal Storage System—the first in the world. BIPC's proprietary Thermal Storage System will enable the concentrated solar power plant to generate electricity on cloudy days and after sunset, reducing cost and over-

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coming the major limitation of solar power. Bell's projected cost for the forty-five acre plant is estimated at $32 million.

According to the Job and Economic Development Impact (JEDI) Model provided by the National Renewable Energy Lab, a 5 megawatt CSP Trough solar power project will produce:

- 148 jobs and $24 million in total economic impact during construction phase
- 16 jobs (direct and indirect) and $2 million per year ($50 million over 25 years) in total economic impact during the operation phase

Not to be overlooked is the positive environmental impact is expected on the region. A 5 megawatt solar power plant will produce approximately 219 million kilowatt hours of electricity over 25 years, the equivalent to avoiding the emission of 15,728 metric tons of Carbon Dioxide or CO2 equivalent. Also, SolarZone@The UATechPark is in active discussions with Tucson Electric Power and four new solar development prospects that could bring new solar generation projects to the Solar Zone demonstrating multiple solar technologies operating at utility scale production. When combined with the BIPC project, the SolarZone would see a substantial cluster of companies locating within its boundaries (overall economic impact estimated at $100-million capital investment).

Blue Skies, Bright Future

While Tucson is known for its abundant sunshine and top-ranked research university, the region is also becoming well-recognized for its abundant human capital, state of the art solar research and technology development, ample supply chain opportunities and competitive operating costs. This translates into opportunity—from sunrise to sunset—for any company wanting to take advantage of the region's unique assets.

Recognized globally as an emerging location of choice for solar energy activities, Tucson's solar industry promises a bright future. The Tucson region continues to attract solar system component manufacturing companies, supporting a wide range of solar industry needs, from research and development to the manufacturing of mounting systems and solar modules. This industry presence brings together potential partners to share labor force skills, technology transfer, industry knowledge and additional business activities.

German-owned SOLON was Arizona's first facility for the manufacturing of photovoltaic equipment. The Tucson plant makes heavy use of robotics.

What companies have leveraged Tucson's emerging solar presence? In addition to Bell Independent Power Corp.'s decision to locate in the new SolarZone@TheUATechPark, other world-class corporations and emerging industry players include SOLON Corp., Schletter, Inc., Global Solar and Prism Solar. These companies are taking advantage of the region's proximity to vendors, suppliers and major consumer markets throughout the Southwest and Western United States.

"California is one of the world's largest solar markets, and Tucson's proximity to California is a major advantage for solar companies in the region. Tucson's strategic location provides area businesses clear access to markets, clients, suppliers and technology partners while operating in a cost-competitive business location," says Joe Snell, president/CEO of Tucson Regional Economic Opportunities, Inc. (TREO), the region's economic development agency.

Tucson has a lower cost of living compared to other major metropolitan areas and is considered one of the most affordable places to live in the West. In addition, Arizona's worker's compensation and unemployment insurance costs are among the lowest in the United States, and Arizona's tax structure is competitive and business-friendly. With lower corporate taxes and lower payroll costs, businesses operating in the Tucson region gain a competitive advantage.

Arizona's new program provides $350 million in incentives to renewable-energy firms expanding or locating in Arizona. The program went into effect January 2010.

Available incentives include the Commercial/Industrial Solar Energy Tax Credit. The Solar Energy Tax Credit is designed to encourage businesses to install solar energy devices at Arizona facilities; the tax credit is equal to 10% of the installed cost of the solar energy device not to exceed $25,000 in credits for one building in a single tax year and $50,000 total credits per business per tax year.

Tax credits can be used to offset Arizona income tax liability; any unused credit amounts can be carried forward for a five-year period. In the 2010 legislative session, the Arizona legislature extended this incentive for an additional six years, to 2016.

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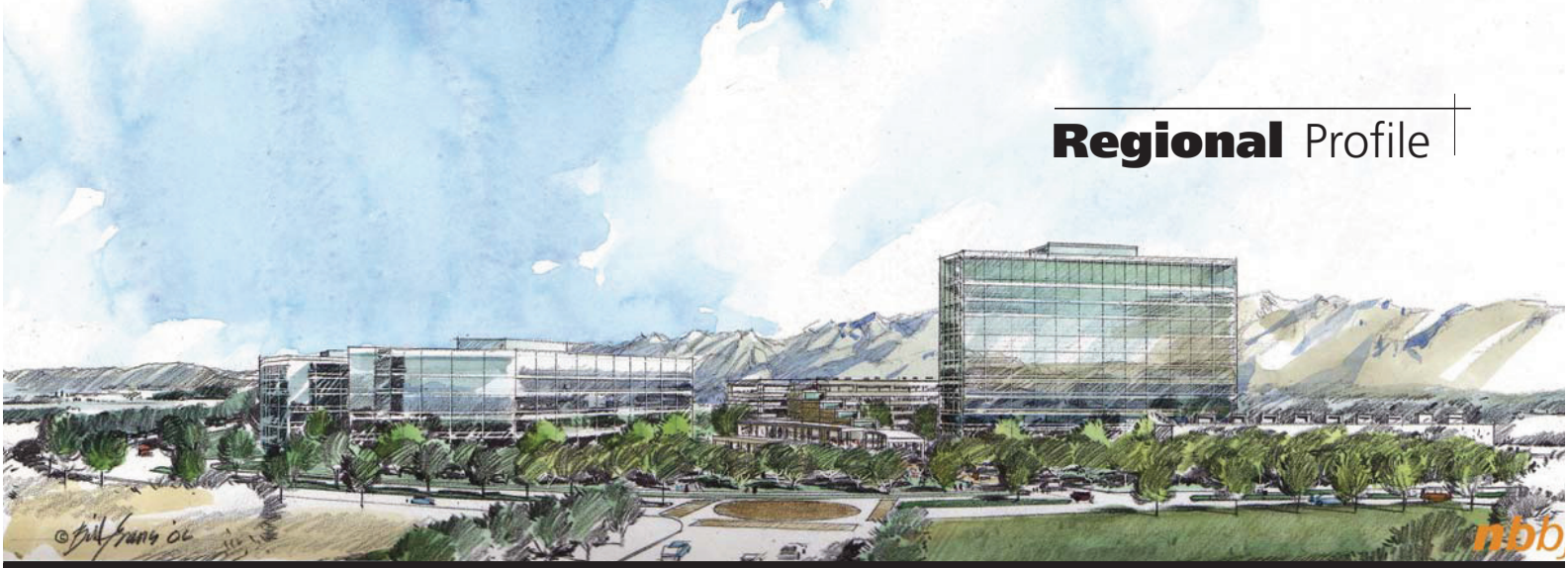

Work on the University of Arizona's BioPark began late last year and will bring research facilities closer to campus.

Tucson Lights Arizona's Path To Personalized Medicine

Recent investments by pharma giants Roche and Sanofi-Aventis complement University of Arizona research institutions, spinoffs

By Theresa Rogers

Personalized healthcare promises to deliver the right medicine to treat a sickness, eliminating trial and error prescriptions of expensive drugs that can affect each patient differently. It is the Holy Grail of medicine and everybody wants a piece of the market that is predicted to reach almost $450 billion in the U.S. in the next five years.

Making it a reality will require a combination of the right diagnostic tools and drugs, backed up by top-flight research from corporations and universities, as well as sophisticated production facilities, computer systems and medical centres to evaluate knowledge gained in clinical trials and from patient experiences.

Tucson, Arizona, is making a strong bid to become one of the centres where personalized medicine will move from theory to practice. The second-largest city in Arizona has the building blocks to make it happen. It is home to Ventana Medical Systems, Inc. (a member of the Roche Group), one of the leading diagnostic tool companies in the U.S. Sanofi-Aventis, the third-largest pharmaceutical company in the world, recently invested $61 million in a research laboratory located in the same business park as Ventana. It is the only lab Sanofi-Aventis has built from scratch in the U.S.

Local corporations such as High Throughput Genomics (HTG), and Luceome Biotechnologies, whose high throughput assays are used to test drugs, are carving out their niches in the diagnostics business. HTG's partners include Merck, Luminex Corp., and the John Wayne Cancer Institute.

Ventana Medical Systems, Inc., focuses on accelerating the discovery and development of new prognostic and predictive cancer tests that enable personalized healthcare.

Critical Path Institute

Tucson is also where the Critical Path Institute (C-Path) coordinates the efforts of almost 500 scientists from 30 leading pharmaceutical companies, patients' rights groups, representatives from the U.S. Food and Drug Administration (FDA), the European Medicines Agency (EMEA), Pharmaceuticals and Medical Devices Agency (PMDA, the Japanese counterpart of the FDA), and a bowlful of other alphabet soup agencies to expedite the development and time to market of pharmaceuticals.

C-Path was formed in 2005 as a not-for-profit centre to break the logjam in the drug development and approval processes. Dr. Ray Woosley, C-Path's CEO, notes that about $120 billion was

spent by the industry, the government and universities in 2008, producing only 21 new drugs at $6 billion per drug. "It takes an average of 15 years for a new product to go from discovery to market," he says. "It does not have to be that way. Drug development for HIV was done quickly: three-and-a-half years including clinical reviews. None have been taken off the market."

University of Arizona

Tucson's academic infrastructure is based on the University of Arizona, one of the nation's leading research institutions. UA includes the BIO5 Institute, which promotes personalized medicine and development of pharmaceuticals by collaborative efforts of academics and graduate students. It draws on the university's departments of medicine, pharmacy, science, engineering and agriculture, as well as bioinformatics capabilities from the Eller College of Management. The university is also involved in promoting elementary and high school science education.

The BIO5 Institute also houses the Clinical and Translational Science Institute, a $20 million UA project to provide patients faster access to laboratory discoveries that could save their lives.

BIO5 Institute has spun out companies such as Luceome Biotechnologies, Cancer Prevention Pharmaceuticals (developer of a drug combination to prevent colon cancer from recurring) and bioVidria, whose silica-based materials improve high throughput screening of new drugs and diagnostics.

UA's Cancer Center has produced 14 biotechnology, medical devices and pharmaceutical companies. It has an annual budget of $78 million.

The UA Science and Technology Park's Arizona Center for Innovation, a Tucson business incubator for biotechnology companies, brings venture capitalists and experienced business executives together with university researchers to bring technology out of the laboratory and into the marketplace.

The UA Science and Technology Park is also building a Bioscience Park near downtown Tucson that will bring research facilities closer to the university campus. The new park will have faculty and student housing, its own Center for Innovation, a hotel and a conference centre. Work began in late 2009.

"The University of Arizona is the largest source of new technology in the life sciences in the state, and we did not want to see all that technology leak out to San Diego or wherever it might go," says Bruce Wright, CEO of the Science and Technology Park. "Part of our strategy was to capture that technology and keep it here and to attract other related activity."

That strategy fits into the overall plan for the development of the life sciences industry in the region by the Tucson Regional Economic Organization (TREO), The Battelle Institute, The Flinn Organization, and other regional and state organizations. TREO hired Michael Porter, the Harvard business expert, to identify four key industries that could shape the region's future. Biotechnology was one, says Joe Snell, TREO President.

"Biotechnology, specifically diagnostics, is an area where we have a unique differentials—Ventana, Sanofi-Aventis, C-Path—combined with BIO5," Snell says. "For a small market we have the right ingredients and we are working very hard to get more."

The University of Arizona's BIO5 Institute ensures scientists from five disciplines: basic science, agriculture, medicine, pharmacy and engineering, find solutions to biology-based challenges affecting humanity today.

Battelle, commissioned by The Flinn Organization of Phoenix, drew up a roadmap for the state and the southern Arizona region to help build a life sciences cluster.

The plan has paid off. *BizTucson*, a local business magazine, estimates the region has almost 100 biotech companies with about 2,000 employees. Walter H. Plosila, Senior Advisor to the Battelle Technology Partnership Practice, said in a December 2009 report, Tucson has added 32 life science establishments since 2002, for an employee growth rate of 58 per cent. There are 15 hospitals with almost 15,000 employees, he said.

Ventana

The biggest addition was undoubtedly Roche's $3.4 billion purchase of Ventana Medical Systems, Inc., in 2008. Founded in 1985 by Thomas Grogan, a pathologist at UA, Ventana had grown to almost 900 employees by the time of the acquisition. Roche paid a sizeable premium for Ventana, not least of all because its diagnostic technology identifies cancerous cells that are treated by Genetech's Herceptin drug. Roche acquired Genetech in 2008.

"We are the global market leaders of tissue based diagnostic," says Hany Massarany, President of Ventana. "We have 6,000-plus systems installed in 35 to 40 countries and we are growing very robustly, and we expect that to continue for the next five years."

Most of the company's customers are large pharmaceutical companies, biopharmaceuticals, clinical labs and pathology labs in hospitals. "We are growing pretty rapidly and have access now to many markets where Roche is well established and we are able to tap into those markets where we could not as a small or mid-sized company," Massarany says.

"There are about 13 million people worldwide with cancer

today and with an aging population that is expected to expand to 27 million by 2030, with 17 million deaths," Massarany adds. "Obviously it is a big issue. We are very passionate about improving the lives of all patients with cancer. We want to change the practice of medicine so that one day cancer can be fully cured."

Roche says in its 2009 Annual Report, total revenue from its Tissue Diagnostics unit (Ventana) were up 29 per cent to $463 million (Cdn.), and that Ventana's immunohistochemistry (IHC) reagents for cancer research racked up a 28 per cent growth in sales to $255.4 million (Cdn.), the second-best seller of Roche's diagnostic products.

As Massarany and other Ventana executives explained during a tour of the company's facilities, the company is aiming for the day when its assays will be used with Herceptin treatments developed by Genetech for breast and gastric cancer. That is the road to personalized medicine, and the reagents and equipment from Ventana will be key to making it happen, in the company's view.

"In one fell swoop when Roche bought us, they completely revalued diagnostic medicine," says Grogan, who is now scientific advisor to the company he founded. "Why should they pay $3.5 billion for little old Ventana? What they have at stake is closer to $50 billion a year."

Tucson is making a strong bid to become one of the centres where personalized medicine will move from theory to practice.

Eric Walk, Ventana's Senior Vice-President and Chief Medical Officer, says the industry's goal is to improve the low response to treatments by identifying patients who will respond positively to a drug and treating them preferentially. "Rather than have only 'one size fits all' strategies, the new model is predicated on a new generation of diagnostic tests" which will target specific diseases, Walk says. "Diagnostics become the companion to pharmaceutical compounds, so the low response rate can be increased to 70 or 80 per cent. These days everyone is talking about companion diagnostics in healthcare," he adds.

As a homegrown success story, and now a central part of a multibillion-dollar international brand name, Ventana obviously has major impact on the local economy and the life sciences industry. One company that has clearly been affected is High Throughput Genomics (HTG), a privately held business that was started in 2001 in an old drugstore in Tucson by Bruce E. Seligmann, PhD, an internationally recognized scientist. Before he started HTG, Seligmann had worked for Ciba-Geigy (Novartis) and Selectide (another UA spinoff which Sanofi-Aventis eventually acquired.)

High Throughput Genomics

HTG grew slowly as a research company until January 2008, when Tim (TJ) Johnson became President and CEO. Johnson had previously been a Senior Vice-President at Ventana, responsible for manufacturing, quality, strategic marketing, corporate development, and product technical support.

At HTG, Johnson completely changed the management team, and redirected the company from a "broad-based life science tools business to more of a personalized medicine company," he says.

"Our growth strategy is pretty simple," Johnson says. "We focus on segments where we have distinct competitive advantages: validation, pre-clinical and clinical. Where we have a competitive advantage and differential values is in fixed tissues."

Clinical testing is growing rapidly, especially in oncology, which depends primarily on fixed tissue samples. Johnson believes that HTG can grow to $50 million in five years. "It will take a good test for prostate or colon to get to that kind of number," he says. "I am learning from Tom [Grogan]. I want to build a mini-Ventana."

Merck has invested $10 million in the new HTG. Luminex Corporation, a leader in biological testing technologies, launched in partnership with HTG a jointly developed gene expression product, qBead Gene Expression Assay, in May 2010. According to Johnson, the product can quickly and accurately measure a select set of genes among many samples. Luminex plans to market it to researchers.

In April 2010, HTG and the John Wayne Cancer Institute agreed to jointly develop a novel mRNA signature to distinguish between early stage melanomas and benign nevi.

HTG is also part of a $40.8 million research program led by Arizona State University to develop systems for the U.S. Department of Health to detect an individual's exposure to radiation in the event of a nuclear or radiological incident. The system would give first responders critical information in the case of a disaster.

Funding

The combination of public and private support for life sciences in Tucson is bringing much needed good news to this city in the heart of the Arizona sunbelt. One ongoing challenge Tucson faces is the relative lack of venture capital in the city and even the state. Harry George, Chairman of HTG, is a native Arizonan and leads a VC firm that has made investments in a number of companies. The private group Desert Angels provides money and managerial expertise to startups. Big pharma is also a source of funding—look at HTG, Ventana and Sanofi-Aventis.

The best funding news recently is the launch of the "Arizona Fund of Funds," spearheaded by George. The goal of the fund is to attract and oversee the investment of as much as $200 million to benefit Arizona's promising, innovative businesses. The program raises investment capital from investors who commit to invest in early-stage Arizona companies, and reinvests those funds in several professionally managed target venture funds. The hope is that with this new effort, Tucson should be able to attract more venture money. BB