



Phoenix
Energy Center

energy center news

Volume V, Issue I • Summer 2014

TGen Headquarters Marks 10 Years Downtown

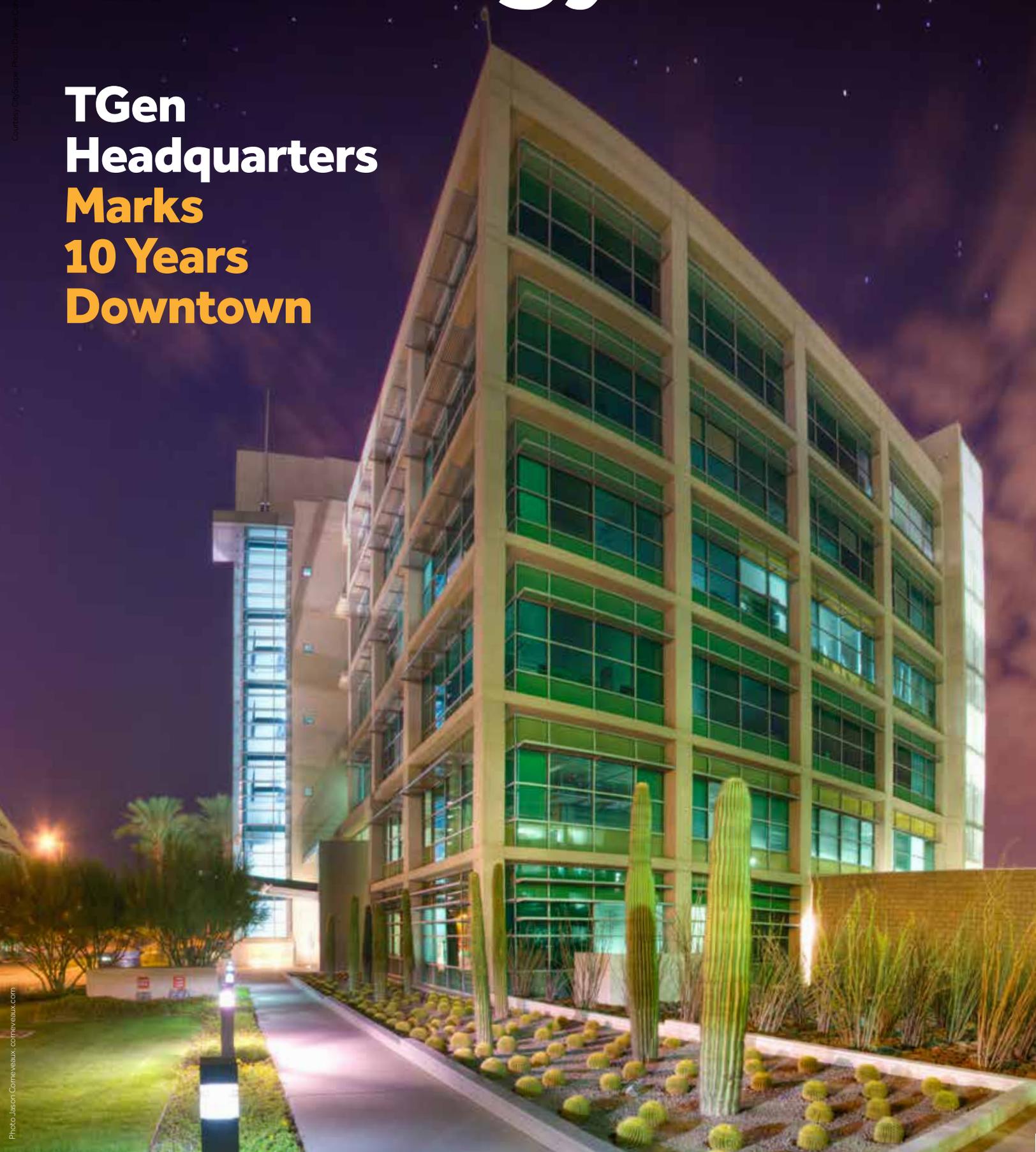


Photo: Jason Comeveaux.com/veaux.com

TGen's Transformative Research

Cutting-edge results can direct patient care

A YOUNG GIRL had been confined to a wheelchair for most of her life. Then, following insight gained from genomic sequencing by the Translational Genomics Research Institute (TGen), she was placed on a medication that enabled her brain to produce dopamine, which restored her muscle control, strength and balance. Now the girl can not only walk, but dance! That is the power of the work TGen is doing right here in Phoenix.

An NRG Energy Center Phoenix district cooling customer, TGen is a world-renowned nonprofit research facility at the heart of the downtown Phoenix Biomedical Campus (PBC). TGen sequences genomes using state-of-the-art technology to identify the possible genetic causes of disease. It spells out, in order, the billions of chemical letters in a patient's DNA and compares the



Courtesy TGen.

In association with local hospitals, TGen's clinical trials have resulted in FDA approval of several cancer drugs in about half the time that it usually takes.

genomes of normal and diseased cells. By noting gene changes, TGen scientists make recommendations to oncologists and other physicians, enabling them to make the best possible choices for patient care and treatment.

Owned by the City of Phoenix, the \$46 million building opened in 2004 and is as cutting edge as the research conducted within its green glass walls. The building's concrete frame structure provides daytime lighting to all laboratory and office areas. It also employs many energy-efficiency strategies, including a variable-air-volume air distribution system, energy recovery from laboratory exhaust, variable-speed pumps, high-efficiency boilers, electronic sensors on faucets, and indirect lighting.

NRG Phoenix provides TGen with reliable district cooling service and

also maintains an emergency cooling connection outside the building for temporary chillers. Although the connection has not been needed in 10 years of service, it's a safety net to help ensure that high-profile research is not interrupted.

NRG Phoenix's district cooling service also meets the research facility's slim noise, vibration, temperature and humidity tolerances. It also frees up valuable building space for research activity because the building does not need large chillers and other mechanical equipment.

NRG Phoenix is proud to provide TGen with the quality chilled-water service it needs to continue its transformative research. Learn more about TGen at tgen.com. For more about PBC, visit biomedicalphoenix.com.

Courtesy TGen.



The six-story, 173,000-square-foot TGen building forms the cornerstone of the Phoenix Biomedical Campus, a bioscience and medical research campus still under development in downtown Phoenix.

The Circle Is Complete

NRG PHOENIX PROVIDES chilled-water service to TGen. TGen provides internships to students from Phoenix Bioscience High School. And people from NRG Phoenix mentor the high school's robotics team (see related article). It's a complete circle, with benefits for all.

TGen's internships are highly coveted. Phoenix Bioscience students can apply for the positions, submitting

to rigorous interviews to get the job.

"Once selected, students are paired with TGen researchers," explains Dr. Quintin Boyce, Principal at Phoenix Bioscience. "Each student works side by side with an expert on actual research projects—collecting and analyzing data, maintaining equipment, etc. The experience gives students invaluable real-world experience that can help guide

their career paths. One student ultimately stayed on with TGen as an employee following the internship program."

The collaboration began shortly after the school opened in 2006, when Phoenix Bioscience—just a few blocks down the road from TGen—contacted the company to see if it would be interested in working together on such a program. Given the school's science focus and students' great interest in the medical field, the result has been a rewarding natural partnership.

Inspiring Tomorrow's Engineers

FIRST Robotics Competition

A NATIONWIDE EVENT involving 250,000 high schoolers, the FIRST Robotics Competition (FRC) has become an inspiration and a training ground for tomorrow's scientists and engineers. NRG Energy, Inc.—NRG Energy Center Phoenix's parent company—supports the program across the country. This year, NRG donated \$80,000 to cover competition entry fees for eight FRC teams, one of which was Dragon Robotics, a team from Phoenix Bioscience High School.

Each year, FRC gives each team six weeks to complete an assigned robot design challenge. Competing in alliances together with other schools' robots, the teams compete in regional contests that blend the excitement of sport with the rigors of science and technology. If successful, teams advance to the national championship. The program emphasizes "coopertition"—a spirit of cooperation even in the face of fierce competition—as well as "gracious professionalism."

Technical professionals mentor each team. This year, Mike Buter, the Operations and Maintenance Manager at

NRG Energy Center Phoenix, mentored the Dragons as they tackled their competition challenge: Design a robot that can throw large workout balls through an opening 10 feet in the air to score points. The Dragons performed well at the 2014 Arizona regional competition, making it to the semifinals from a field of 51 teams.

"I am so impressed by what these students accomplish at such a young age," says Mike. "From design and building

to using sophisticated software and hardware, they're already learning real-world engineering and teamwork skills. It was an honor to work with such a great group. I can't wait to do it again next year."

NRG Phoenix congratulates the Dragons on a great season. We look forward to continuing our support in 2015. For more information on FRC, visit usfirst.org. For more on the Dragon Robotics team, visit tinyurl.com/dragon2375.



Courtesy Dragon Robotics.

Dragon team members prepare their robot, Malificent, for battle at the Arizona regional competition held in March.

Equipped for Reliability, Efficiency

New cooling towers in the lineup at Chase Field

In downtown Phoenix, the start of the baseball season signals the beginning of warmer weather and a greater need for air conditioning. NRG Energy Center Phoenix (previously Northwind Phoenix) has operated the chillers at Chase Field since 2001, just three years after it opened as BankOne Ballpark in 1998.

The chillers have run well, serving Chase Field and surrounding buildings as well as interconnecting with the rest of the system. They've kept the Diamondbacks and their fans comfortable under the stadium's roof—in spite of outdoor high temperatures averaging 99° F during the D-backs' season. The related concrete cooling towers, however, were showing

the strain of constant use, so shortly after the season ended last fall, we kicked off a project to replace them. The project wrapped up in mid-April.

"Anyone who's been to Phoenix can imagine how vital air conditioning is when it comes to playing and enjoying major league baseball," says Gary Cheek, Downtown Operations and Maintenance Manager, NRG Phoenix. "To maintain reliable space conditioning, we knew it was time to change out the existing four concrete cooling towers and replace them with six stainless steel models. Cooling towers are vital to air-conditioning efficiency as they remove heat that's generated by the chillers as they produce chilled water. That ensures optimal chiller operation."

The new stainless steel Marley cooling towers will occupy a smaller footprint

and reduce the amount of ongoing maintenance.



Crews drilled 12 new holes and used four existing ones for the caissons to support NRG Phoenix's new cooling towers. The caissons—concrete columns drilled and cast into the ground as foundation supports—are each 15-feet high and 36 inches in diameter.

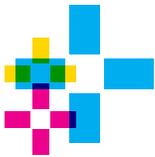


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Printed on paper made of 30% post-consumer waste.



FROM THE GENERAL MANAGER

Innovation and Growth for a Brighter Future

Photo: Tevis Photographic



WHEN WE BEGAN flowing chilled water for air conditioning to Translational Genomics Research Institute's (TGen's) new headquarters in 2004, TGen was just two years old

and had been operating out of temporary office and lab space in and around Phoenix. Fast forward 10 years and it's clear that TGen has taken genomics research to a whole new level. (See our cover story.)

TGen has a reputation for innovation, which we too embrace as part of the NRG Energy, Inc. family of companies. In the past four months alone, NRG launched the world's largest solar thermal project at Ivanpah in California; completed construction of Agua Caliente, the world's largest fully operational solar photovoltaic facility; surpassed 1,200 megawatts of solar capacity; and expanded its portfolio of professional football stadiums equipped

with sustainable energy solutions.

NRG is also growing. At the end of last year, NRG Yield purchased Energy Systems Company, a highly valued district heating and cooling system in Omaha, Nebraska. And within the past several months, NRG acquired Edison Mission Energy, creating the country's second-largest power company and the third-largest U.S.-based renewable energy generator with an industry-leading wind and solar portfolio; Dominion Resources, Inc., significantly expanding NRG's Northeast retail footprint; and Roof Diagnostics Solar, one of the nation's leading residential solar companies.

With a good half year still ahead, there will be even more innovation and growth for NRG and NRG Energy Center Phoenix. We're pleased to be your gateway to all NRG has to offer—all with reliability and customer service in mind.

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In Good Company

NRG Energy Centers serve hotels nationwide

NRG Energy Centers cool and/or heat 43 hotels with nearly 15,000 rooms across the U.S. NRG Energy Center San Francisco serves the largest hotel on any of the systems—the Hilton San Francisco Union Square with more than 1,900 rooms. The Hilton also happens to be the largest hotel on the West Coast. Outside San Francisco, the 1,000-room Sheraton Phoenix Downtown Hotel is the largest hotel on an NRG Energy Center system. It has been an NRG Phoenix chilled-water customer since it opened in 2008.



NRG Energy Centers serve 43 hotels with 15,000 rooms nationwide.