

Energy City Exhibit with Vivitek Projectors Energizes 110-year-old Houston Museum of Natural Science

To bring rich visuals, Wiess Energy Hall uses laser light source projection for its mapping exhibit

Overview

Houston's Museum of Natural Science strives to fulfill a singular mission: to “enhance in individuals the knowledge and delight in natural science and related subjects.” This pursuit underlies every project, program and exhibition associated with the museum and is exemplified in the institution's Wiess Energy Hall. Recently enlarged from 8,500 square feet to 30,000 square feet, the Wiess Energy Hall is a testament to Houston's key role in the United States energy sector, with exhibits dedicated to conservation, renewable energy, hydrogen power and natural gas.



Challenge

While museums hold a unique place in American culture for their ability to blend education and entertainment, audiences are increasingly more difficult to engage in a society where our smart phones provide an endless diet of visual experiences. Modern museums are faced with the difficult task of keeping their exhibits stimulating. For the Wiess Energy Hall, this meant redesigning traditional displays and fostering an entirely new thematic exhibit. Thus, the idea for Energy City was born, consisting of a 2,500-square-foot, 3D landscape of Houston. The concept of creating this 3D landscape using moving mechanical parts, gears and

motors was ruled out immediately due to the day-and-night maintenance that would be required. This project would be a first for the facility in both size and complexity, so it was imperative that the project be cost-effective, require minimal oversight and utilize technology that could last throughout the life of a museum exhibit, which averages 10 years. Ultimately, projection mapping paired with cutting-edge animation was selected to bring the energy value chain to life. This would be the first projection mapping exhibit of its type and the most ambitious project that the museum had embarked upon.

Solution

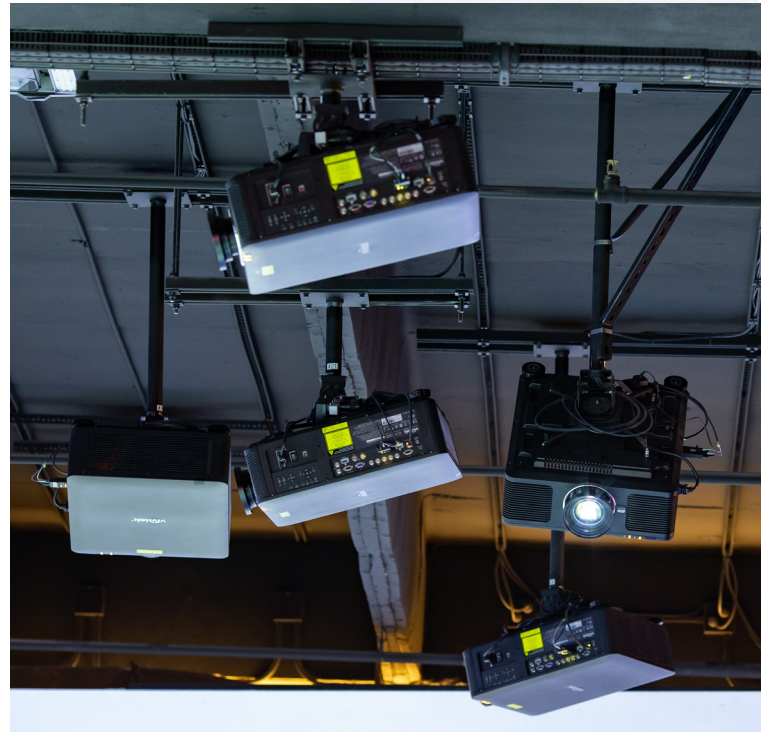
To design and fabricate the landscape, Wiess Energy Hall selected Paul Bernhard Exhibit Design and Consulting (PBE), which reimagined the expansive Gulf coastal waters and landscapes of Southeast and Central Texas for Energy City. PBE then selected production company RabCup to provide the technical knowledge needed to animate the project in a way that would both educate and delight guests, in accordance with the museum's mission.

Recognizing Wiess Energy Hall's concerns and the technological needs of a project on this scale, RabCup examined several projector products and brands. In the end, the team determined that Delta's Vivitek brand was the best choice to provide projectors with the lifespan, efficiency and maintenance support needed to make the exhibit successful. RabCup installed 32 Vivitek DU8090Z laser projectors throughout the exhibit. Equipped with a laser light source, the DU8090Z utilizes Digital Light Processing (DLP®) technology, also referred to as Digital Micro-Mirrors (DMD). Developed by Texas Instruments (TI), DLP enables Vivitek's projectors to deliver vibrant and rich picture quality. The DU8090Z also features a WUXGA resolution, amazing 8,000 ANSI Lumens of brightness, and a remarkable 10,000:1 contrast ratio. This contrast ratio was critical to ensuring the exhibit's crisp and immersive visuals were maintained, even during night scenes and that the projectors' lenses were not visible in the dark. "Vivitek's projectors checked all the boxes," said AJ Freysteinson, creative director and co-founder of RabCup. "We needed projectors that could bring a wow-factor to the amazing custom animation created for this installation, but even more important was the reliability. The projectors that we installed

would need to run more than 50 hours a week for as long as 10 years, with minimal upkeep.

It's no small task, but we found the performance, durability and personalized support we needed with Vivitek."

Among Vivitek's key differentiators is its laser-based light source, sealed optical engine, and filter-less design. When Wiess Energy Hall was being planned, laser-based solutions were extremely limited. Furthermore, the majority of laser-based projectors on the market were also largely cost-prohibitive.



Vivitek surpassed its competition in terms of warranty and support, beating other companies by as much as two years. This long-term protection on swappables and parts was critical for a project that could last upwards of a decade. As an added benefit, Vivitek worked closely with RabCup to ensure the exhibit had the necessary back-up components and projectors on site, should any parts require placements. The museum team was offered a direct line to Vivitek's support staff, whenever they needed assistance with any challenges.

Results

Since opening in late 2017, Energy City has proven to be among the museum's top attractions. The project can be considered a behemoth, with its 32 projectors, 168 fiber optic sensors, four miles of fiber optic cable and more than 30 minutes of custom animation, including a five-minute day-to-night scene and eight science modules. Vivitek's projectors have stood out among the components in the installation. For Energy City's first year of operations, the projectors ran for more than 3,000 hours. By comparison, lamp-based solutions would have needed to be replaced three times at this point – a collective total of 96 bulbs. Given this fact, a lamp-based alternative would have necessitated the use of nearly 1,000 bulbs throughout the life of the exhibit, resulting in substantial time and money to replace and recalibrate the units, as well as exhibition delays to allow for the proper reset and testing.

While the project is still young, museum officials are thrilled with the results. The exhibition runs seamlessly every day, captivating Houston residents and visitors alike. Energy City has drawn praise from local energy companies, as well as outside museums that have sought to emulate the installation.

"Energy City was quite a feat and, despite seeing it regularly for more than a year, it continues to amaze me," said Dustin Newcomb, director of exhibits at Wiess Energy Hall. "Being able to deliver rich colors, deep blacks and crisp whites time and again is a huge part of what makes installations like this one magical and memorable. In an age where kids are growing up with unlimited access to information and entertainment, our ability to create astonishingly breathtaking and immersive experiences like Energy City is critical to ensuring that museums endure long into the future."



Summary

Cutting-edge projection technology from Delta's Vivitek brand has delivered superior performance and reliability, allowing the Houston Museum of Natural Science's Wiess Energy Hall to continue its longstanding mission of entertaining and delighting well into the modern age.