



# The Science Behind an Effective Energy Management Strategy for a Houston Landmark

Experts at GDF SUEZ Energy Resources team up with Energy Edge Consulting to take a unique approach to delivering a cost-effective and environmentally driven energy strategy for the Houston Museum of Natural Science.

At the beginning of 2012, the Houston Museum of Natural Science was nearing completion of a massive expansion project to virtually double the square footage of its primary location in the heart of the Bayou City's Museum District. The added space marked a significant step in the nonprofit's growth plans, but it also created several questions about future energy load, consumption, and costs.

In short, the nonprofit had reached a crossroads in its energy management strategy.

## The Background

The Houston Museum of Natural Science was established in 1909 by the Houston Museum and Scientific Society in downtown Houston. In 1969, it moved to its current location in Hermann Park, where it quickly became a prominent fixture in the city's highly regarded Museum District.

Over the years, the nonprofit grew substantially, earning a reputation as one of the most heavily attended museums in the nation.

By the mid-2000s, its Hermann Park location boasted four floors of permanent exhibit halls, the Wortham Giant Screen Theatre, the Cockrell Butterfly Center, and the Burke Baker Planetarium. It also operated a satellite facility – the George Observatory in Brazos Bend State Park – and plans were in the works to soon open the Houston Museum of Natural Science at Sugar Land.

However, the nonprofit saw a critical need for more space in its Museum District location. With a growing annual attendance – which averaged 2 million visitors, including 500,000 schoolchildren and 50,000 members – additional exhibit halls, educational areas, and storage space for conservation of collections were rapidly becoming key priorities.

In 2009, as the museum celebrated 100 years of service to the community, it kicked off a sizeable three-year expansion plan to renovate its existing 30,000-square-foot paleontology hall and add more than 115,000 square feet of much needed space.

The project would effectively double the number of classrooms currently available for educational programs, double the amount of public exhibition space for temporary and permanent installations, and triple the amount storage of space to ensure conservation and care of collections.

## The Challenge

The museum needed to reevaluate its energy procurement approach in light of operational changes that would take place when the additional space opened in 2012. However, upgrades begun to the facility's HVAC system were making it difficult to forecast consumption and costs.

Prior to the expansion, the museum had been using the building's original HVAC system to heat and cool the facility. A new central HVAC plant was being constructed as part of the expansion to accommodate the additional square footage, but it wouldn't replace the old boiler system entirely. Instead, the two systems would work together to heat and cool both the original and expanded portions of the facility.

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To build an effective long-term plan, the nonprofit turned to Energy Edge Consulting with three specific objectives:

- Accurately forecast consumption and demand, accounting for both the sizable addition and the improved efficiency of the new plant;
- Identify and leverage an energy management product that helps manage energy price risks, protecting against spikes while exploiting price drops; and
- Pursue a retail electricity supplier whose offer goes beyond competitive pricing to include opportunities for cross promotion.

## The Solution

After evaluating forecasts while weighing product options and organizational priorities, the Houston Museum of Natural Science opted for a Heat Rate product with GDF SUEZ Energy Resources. When diligently overseen, this managed product can provide a certain degree of risk protection while giving the consumer the ability to take advantage of market opportunities through properly executed transactions.

Similar to a Block and Index plan, Heat Rate products allow customers to fix portions of their load based on specific natural gas prices and let the remaining portion of the load float based on natural gas prices. The contract is based on a conversion factor (Heat Rate), which is the amount of an input fuel (i.e., natural gas) needed to produce a given amount of electricity; this is commonly utilized in regions where natural gas plays a more significant role in the mix of generation resources.

“We view the efficiency and integrity with which GDF SUEZ Energy Resources executes transactions for managed products to be superb,” said David Mosley, Director of Energy Procurement and Price Risk Management Services for Energy Edge Consulting. “Their contracts are as solid as their corporate balance sheet, and in the case of the museum, it contained numerous additional obligations that went beyond the typical supply responsibilities. They were sincerely interested and dedicated to helping the nonprofit realize a successful energy program.”

Since entering into the agreement, GDF SUEZ Energy Resources has made a series of donations to the museum to support various programs and initiatives in addition to delivering electricity. The retail supplier has provided visitors to the landmark venue with a green destination

on four occasions through gifts of Renewable Energy Certificates (RECs) that offset the museum’s estimated consumption for an entire month at a time.

The RECs, which are Green-e® Energy Certified, represent the benefits associated with a specific quantity of energy generated from a renewable source, such as solar or wind.

Each donation has further supported the nonprofit’s commitment to environmental responsibility. According to the U.S. Energy Information Administration, GDF SUEZ Energy Resources’ REC contributions to the museum over the last three years are equivalent to the carbon sequestered by 19,066 tree seedlings grown for 10 years, the removal of about 744 metric tons of CO<sub>2</sub> from the atmosphere, the displacement of the estimated annual greenhouse gas emissions of 157 passenger vehicles, or the CO<sub>2</sub> emissions from the energy used by 68 homes for one year.

“We have been happy to support the Houston Museum of Natural Science in achieving the right energy management strategy for their business,” said Sam Henry, President and CEO of GDF SUEZ Energy Resources. “We share a common interest in promoting clean energy and are pleased to continue to help this important venue as they do their part to reduce their carbon footprint.”

Joel Bartsch, President of the Houston Museum of Natural Science, added, “The past three years have marked an exciting time of growth for the museum. GDF SUEZ Energy Resources and Energy Edge Consulting have helped us maintain a strategic focus on how we manage long-term costs and our commitment to environmental stewardship. We couldn’t be more pleased to have them as trusted business resources.”

## Conclusion

This case study demonstrates the value brought to consumers by combining the supply expertise of retail energy providers like GDF SUEZ Energy Resources and the knowledge and insight of channel resources like Energy Edge Consulting.

When building any energy management strategy, clear organizational priorities and objectives are key to making the right procurement decision for your business. Whether working through a channel ally or selling directly to customers, the in-house energy experts at GDF SUEZ Energy Resources take the time to learn about your business, and customize products and services to strike the right balance between market risk and price certainty.

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We have a 99.8 percent billing accuracy rate and an unrivaled commitment to price transparency. We're also backed by the financial strength of one of the world's largest corporations, GDF SUEZ, which provides us with the balance sheet large consumers need to take advantage of significant transactions.

With a demonstrated record of billing precision, customer service, industry leadership, and financial strength, GDF SUEZ Energy Resources is a leader in U.S. retail energy and the clear choice for commercial and industrial electricity buyers.

### **About the Houston Museum of Natural Science**

The Houston Museum of Natural Science – one of the nation's most heavily attended museums – is a centerpiece of the Houston Museum District. With four floors of permanent exhibit halls as well as the Wortham Giant Screen Theatre, Cockrell Butterfly Center, Burke Baker Planetarium, George Observatory, and HMNS Sugar Land, and an ever-changing roster of world-class touring exhibitions, the museum has something to delight every age group. With such diverse and extraordinary offerings, a trip to the Houston Museum of Natural Science, located at 5555 Hermann Park Drive, is always an adventure.

## **HEAT RATE PRODUCTS**

### *Flexible, Transparent Energy Price*

Pricing for a Heat Rate product is calculated on a calendar month by multiplying a Heat Rate by a variable gas price (Gas Index), then adding the Retail Adder.

**Electricity Price = (Heat Rate x Gas Index) + Retail Adder**

- Heat Rate – Set at contract signing
- Gas Index – Floating price on index (NYMEX)
- Retail Adder – Set at contract signing

The Gas Index varies based on the monthly Henry Hub settlement price of natural gas. The Gas Index can be replaced by a Fixed Gas Price by locking in the price of natural gas used in the equation.

**Heat Rate products are suitable for:**

- Companies with a risk tolerance for fluctuations in power prices and natural gas prices
- Companies with a preference for a high level of price transparency
- Companies with procurement personnel who are familiar with the natural gas market and are accustomed to regular monitoring of natural gas prices.

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