SIGMA DESIGN COMPANY

Clean Energy

Sigma Design Company is a leader in designing, testing, optimizing and manufacturing products and systems for the clean energy industry.

For more than 20 years, Sigma Design Company has been a proven design and manufacturing partner for clients involved in energy and cleantech. Our client roster includes OEMs; some of the United States' most prestigious private, academic and governmental laboratories; and utilities engaged in hydro, solar, nuclear and wind energy, as well as early-stage companies looking to develop clean technology products and systems.

All work takes place at our state-of-the-art 20,000 square foot Technology Commercialization and New Product Manufacturing Center in Middlesex, New Jersey, USA. Sigma Design Company maintains a Quality Management Program in accordance with ISO 13485 and ISO 9001.

SERVICES

Our comprehensive services encompass the entire product development cycle. They include design engineering, design and cost analysis, prototyping, photo-realistic simulation, electronics, low volume (100s) highly specialized manufacturing and testing, and larger manufacturing runs.

We employ advanced engineering, simulation and rapid prototyping technology to speed time to market while helping clients reduce risks and costs associated with product development. In addition to engineering new solutions, our team also evaluates products and systems under development, using advanced engineering analysis including FEA, CFD, structural stress, deflection, fluid flow and heat transfer simulation. These computer aided engineering (CAE) tools allow us to uncover and detect non-obvious, counter-intuitive design flaws early in the process.

We bring to our clients broad manufacturing knowledge and experience that helps streamline the process. Sigma Design also develops stringent test protocols and performs factory acceptance testing on all the electro-mechanical systems we build.

CASE STUDY

Hydrokinetic River Turbines

A Boston venture group engaged Sigma Design to develop a pilot renewable energy hydrokinetic generator system to capture alternative energy. This system was a pivotal milestone for the venture's funding, and they needed this fully submerged run-of-river device in the water and producing electrical energy in just six months from the initial meeting. In addition to the accelerated timeline, the project presented several other challenges solved by Sigma Design, most notably the power generating electronics, hydrodynamic balancing, and marine submersion anti-fouling prevention. The 1-meter 3kW run-of-river electric generator was designed, manufactured and installed on schedule and is still running deep in the Mississippi River, north of New Orleans.

Services Performed:
Sigma Design led development, manufacturing and testing for this milestone project. Services included concept development, flow simulation, detail system design, electronics, fabrication and testing.



PROVEN RESULTS

Since our founding in 1999, Sigma Design Company has delivered more than 1,000 successful design and design/build projects, on time and on budget, and saving our clients hundreds of thousands of dollars in manufacturing.

We have worked with scores of customers in the energy and cleantech industry including:

- Voith Hydro
- Bloom Energy
- National Renewable Energy Laboratory
- US Army Corps of Engineers
- Parker and Hoover Dams / United States Bureau of Reclamation
- PSE&G
- Free Flow Power
- Rutgers University
- GCK Technology, Inc.
- Wattlots

CASE STUDY

Solar Parking Canopies Combine Design and Functionality

Sigma Design Company was tasked with a challenge: develop and manufacture solar parking canopies that couple superior functionality and aesthetically pleasing design.

The client, a renewable energy company, had an idea that updated the look and efficiency of solar parking canopies. Unlike the typical large, bulky structures often used in parking lots, these were different in both form and function. Sigma developed unique trackers for the PowerArbor™ that allows this solar canopy to capture 25% more energy than stationary grids.

Besides providing good looks and performance, Sigma had to make sure that the stylish solar canopies were structurally safe and sound. A variety of tests were done to determine their ability to withstand hurricane-force winds. Then Hurricane Sandy happened. The installation was half completed when it the storm hit – but as it was engineered to do, the system passed the most critical test of all with flying colors, incurring no damage.

Sigma had performed a simulated hurricane wind analysis to better determine wind-induced loads. The firm studied and used this data to update various structural components, which improved the arbor's ability to withstand 120 mph hurricane winds.

Services Performed:

In addition to manufacturing the solar tracker, Sigma provided concepts, wind-land simulation, detail design, electronics, product development and testing.