

## QUESTIONS & ANSWERS

### ABOUT THE PROJECT

**QUESTION: What is the East Harris County Solar Pilot Program?**

**ANSWER:** The East Harris County Solar Pilot Program is a partnership between the Houston Advanced Research Center (HARC) and Pasadena Independent School District (PISD) to test and demonstrate the effective use of solar technologies in a school environment and to provide a dynamic, hands-on laboratory where students will gain a better understanding of a renewable energy resource.

**QUESTION: What is the size of the project and what are its key objectives?**

**ANSWER:** The total power capacity is approximately 145kW divided between Sam Rayburn and South Houston High Schools. Upon completion, these schools will have the largest rooftop solar installation of any Texas public school. The program will demonstrate the viability of six solar panel and installation solution combinations in this region with several key objectives:

- design and install a solar system that is sustainable;
- provide a solar energy system that visibly demonstrates how a solar energy system can be installed on an existing structure in several ways;
- collect, interpret and report data to study the benefits and efficiency of the diverse systems;
- allow students, architects, scientists, engineers and others to investigate the durability and performance of the solar energy system installed; and
- offer PISD students real-world experience in assessing the performance of a major rooftop solar installation.

**QUESTION: What is the total cost of the project?**

**ANSWER:** Total funding for the program is \$2 million, which will be used to pay for educational programs, the solar installation, and related solar research.

**QUESTION: Who is funding the project?**

**ANSWER:** The school district is not paying for the installation. Funding for the East Harris County Solar Pilot Program was made pursuant to the settlement of a Clean Air Act enforcement suit brought by Environment Texas and the Sierra Club.

**QUESTION: How will the solar power produced benefit the schools?**

**ANSWER:** Students at the two schools will have a rare opportunity to participate in a hands-on educational program to assess the viability of solar energy. In addition, the solar power produced will reduce the schools' annual power expenses.

## EAST HARRIS COUNTY SOLAR PILOT PROGRAM

---

**QUESTION:** How much money is PISD projected to save annually in utility costs? How will the project reduce the two schools' environmental footprint?

**ANSWER:** Sam Rayburn and South Houston High School will reduce combined annual utility costs by approximately \$15,000. We anticipate a total estimated kilowatt hour reduction of about 172,000 kWh annually and green house reduction of gases by 124 metric tons of Carbon Dioxide Equivalent (CO<sub>2</sub>) per year -- the equivalent of 14,000 gallons of gasoline consumed.

**QUESTION:** What other measures will determine the project's success?

**ANSWER:** In addition to the generation of electricity from the solar panels, the project's success will be determined by the implementation of energy conservation lessons and curriculum in the participating high schools for years to come.

**QUESTION:** How will the solar systems be installed, and how much time is needed for installation?

**ANSWER:** The entire system for each campus will be mounted and secured on building roofs and alongside outside walls on awnings. Installation construction is scheduled to begin this summer with completion in the fall.

### **PROJECT PARTNERS**

**QUESTION:** What is HARC's role in this project?

**ANSWER:** Environment Texas contacted HARC to discuss multiple project scenarios and possibilities, and the East Harris County Solar Pilot Project was accepted. HARC is the project manager and has contracted with **Broaddus & Associates** to provide construction site management and weekly progress reports through project completion. Annual review of the system will be conducted by Ignite Solar and its contractors for five years thereafter. HARC will provide ongoing research and analysis of the installed systems.

**QUESTION:** How was PISD selected, and what is its role?

**ANSWER:** In accordance with the consent decree, HARC selected a school district in East Harris County. Pasadena ISD was selected based on their credentials and interest in educating students in the area of alternative energy, for example, their A+ for Energy Award for Sam Rayburn High School's Project Helios.

**QUESTION:** What is PISD's Project Helios and its impact on the East Harris County Solar Pilot Program?

The objective of PISD's Project Helios is to implement renewable resource projects that enhance awareness among students, teachers and the community. PISD teachers introduced new curriculum and science topics related to environmental issues, including solar photovoltaic as a renewable resource. Sam Rayburn High School's main focus is student participation in building and implementing a solar photovoltaic system.

## EAST HARRIS COUNTY SOLAR PILOT PROGRAM

---

**QUESTION:** Who is Ignite Solar, and what is its role?

**ANSWER:** Ignite Solar specializes in the design of commercial and large-scale solar photovoltaic projects and manufactures tracking systems in the U.S. Ignite Solar will provide a comprehensive turn-key solar project that incorporates dynamic educational components. Ignite Solar plans to use Houston-based American Electric Technologies (NASDAQ: AETI) for power distribution and converter systems and Solar Community for panel installation.

**QUESTION:** How was Ignite Solar selected?

**ANSWER:** Proposals and presentations were reviewed and scored by an evaluation committee comprising HARC, PISD and the Port of Houston Authority.

**QUESTION:** Who is AETI, and what is its role?

**ANSWER:** Ignite Solar plans to use AETI for power distribution and coordination and implementation of the Web-based interaction for students.

### **SOLAR TECHNOLOGIES & POWER GENERATION**

**QUESTION:** What solar technologies will be installed?

**ANSWER:** Three types of photovoltaic (PV) solar cell technologies will be used and grouped into four zones of monitoring for data collection and research. These include multi-crystalline cells, which comprise more than 50 percent of the total installation, thin-film amorphous cells, and cylindrical cells (the latter technology not yet installed in Houston).

**QUESTION:** How do these three systems differ?

**ANSWER:** Multi-crystalline cells are made from a block of silicon that has multiple crystals. These panels are square in shape and may have a surface that looks somewhat like a mosaic. Highly efficient and cost effective, they are the most proven technology on the market. Amorphous cells, generally referred to as thin-film, offer an innovative alternative to the multi-crystalline cell as it works well at lower light levels and in high temperatures. Most important, they use less than one percent of the raw material (silicon) compared to standard crystalline silicon, leading to significant cost saving. Cylindrical modules consist of rows of cylindrical tubes with spaces between them that allow the wind to pass through, decreasing wind loads and making it unnecessary to bolt or weigh down the panels. They also work well at lower light levels.

**QUESTION:** What factors contribute to solar power production?

**ANSWER:** Actual production will depend on various factors including, but not limited to, the amount of sunlight for the given year (which varies), weather conditions, debris, dust, and tree growth over time that may shade the panels.

**QUESTION:** How will students monitor and manage the data collected?

**ANSWER:** Automated data collection and monitoring equipment and software will allow students and teachers to measure solar performance and monitor maintenance and servicing needs via the Internet. This information will be accessible from self-service kiosks located in the foyer at Sam Rayburn and South Houston High School. In addition, Web-based outdoor waterproof cameras will be used for panel surveillance and demonstration purposes to the kiosk.

**QUESTION:** How durable are the panels?

**ANSWER:** Panel wind storm ratings meet category 3 hurricane winds of 130mph, and impact ratings are 25mm hail at 23m/s as per IEC certification standard 61646.  
*\* International Electrotechnical Commission (IEC) standard 61646 certify that these modules will meet performance and safety specifications under challenging environmental conditions.*