



Rob Threlkeld of GM talks about using renewable energy at Orion plant.

GM Invests in Orion Plant and Community

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will generate more than 14 megawatts of electricity from landfill gas, which will help GM avoid producing more than 89,000 metric tons of CO2 every year.

That, Threlkeld said, is the equivalent to the annual greenhouse gas emissions of 18,542 passenger vehicles. GM will also save a combined \$10 million in energy costs each year at the facilities.

"We have made a public commitment to increase our use of renewable energy within GM to 125 megawatts by 2020," Threlkeld said. "This expansion represents more than 10 percent of that goal."

He said that when the project is completed in May, a full 54 percent of Orion's energy will come from renewable landfill gas.

"With this project in place, we are converting landfill gas into our own electricity, which, in essence, allows us to act as our own utility," said Bill Mortimer, GM co-generation project manager. "Not only does this help us save on energy costs, but it limits the amount of greenhouse gas released into the atmosphere."

Christine Sitek, GM's North American Manufacturing manager, said the landfill gas projects are just a few of the things the company is doing to be greener and to save money.

For example, Sitek said, the company now has 85 manufacturing facilities that are landfill-

free out of a total 156 global manufacturing facilities that report through GM's Environmental System. Overall, GM has a total of 109 landfill free facilities.

The most recent one was just announced on Dec. 2 at the GMCH Rochester site in New York State.

In addition to announcing the new landfill gas plan on Dec. 4, the GM Foundation also donated \$50,000 to be divided among five charities that operate in and around Lake Orion.

Lori Wingerter, vice president of the GM Foundation, said the people who work at the Orion Assembly Plant are a part of the larger community and are generous with their time and money in supporting worthy local causes.

Through the GM Foundation's Plant City, donations were given to the Boys and Girls Clubs of Southeastern Michigan. The money will help provide quality youth development programs and services to local children, Wingerter said.

Money was also presented to the Oakland Livingston Human Service Agency to help with its mission of empowering people to gain the knowledge, skill and resources to improve their lives, Wingerter said.

The CARE House of Oakland County also received a grant, Wingerter said, as did the Lake Orion Veterans Memorial and the Clinton River Watershed Council, which has a program that allows students to have an outdoor classroom experience while testing water quality along the Clinton River.

"This year, the GM Foundation is providing \$1.6 million to nearly 200 organizations in 45 plant cities where GM employees live and work," Wingerter said.

"Through the Plant City Grants initiative, we're helping our neighbors in Lake Orion and Pontiac, as well as those in communities across the country, continue to receive critical services from vital nonprofit organizations."

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Caddy Elmiraj Bridges Sculpting, Math Gap

Art meets science in the 2014 Cadillac Elmiraj.

That's how David Caldwell, manager of Cadillac Communications describes the car that uses the latest technology, such as structured-light 3-D scanning.

An advanced measuring technology often used for fine art restoration and reproduction, structured-light 3-D scanning helped create a "work of art" in the Cadillac Elmiraj concept car that appeared at the recent Los Angeles International Auto Show.

3-D scanning uses projected light patterns and an advanced camera to capture three-dimensional shapes and translate them into math data that can be manipulated in digital modeling programs.

Developers of Elmiraj, a modern update of a classic two-door grand coupe, extensively used the digital mapping technology.

"With the Elmiraj, we were able to use 3-D scanning as the bridge between traditional hand-sculpting teams who work in clay and digital modeling design teams who work in math," said Frank Saucedo, director of General Motors' North Hollywood Advanced Design Studio.

"Our ability to scan the clay model with speed and precision and go from the digital tools to the hands of a craftsman and vice versa was extremely valuable."

3-D scanning plays an increasingly important role in car design, which typically starts when a 2-D image is turned into a 3-D mathematical rendering. Math models serve as the basis for computer-controlled milling and hand-modeling in clay. 3-D scanners allow designers to quickly reverse-engineer and update the master math model. Changes made to the math model are in

turn updated in the physical model by milling the clay.

GM has used 3-D scanning since 2001, more on clay interior and exterior properties than drivable concept cars, Caldwell said. Elmiraj is an exception. GM's Design Center Fabrication Shops in Warren and Advanced Design Studio in California used 3-D scanning to validate nearly every pattern, mold and part during each phase of the vehicle build.

"It provides a means of recording every design change with the utmost accuracy," said David Bolognino, director of GM Design

Fabrication Operations. "A scan can even reveal the need to take a step back to a previous iteration, and 3-D scanning makes it relatively easy to do."

3-D scanners project a light pattern onto the vehicle surface while a camera looks for distortions that represent curves or contours, and records where the object is in space and its orientation.

Each scan is digitally stitched together until the complete vehicle is captured. That data can be uploaded into a computer-controlled milling machine to create a full-scale model.

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