

Harnessing The Sun

Dual Tracking Solar System in North Georgia

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In the quiet hills of North Georgia sits a magnificent piece of modern, leading edge technology. Motorists stop, take pictures, and get out of their cars to take a closer look. Property owner, Aron Hendrix, doesn't mind a bit. In fact, he welcomes visitors and could talk for hours about the benefits of his dual tracking solar system. Standing 30 feet tall, with 36 high quality monocrystalline 240 watt solar panels and generating upwards of 50 kilowatts of power daily, it's pretty impressive.



Aron Hendrix researched and studied solar power for many years. He evaluated multiple types of systems: roof panels, fixed solar panel racks, and single and dual axis tracking systems. The wide open field in front of his welding business offered the perfect sunny location. Defining a system that would meet Hendrix's objectives, integrating the components, and getting them installed required the assistance of an experienced integrator and installer. Hendrix found his match in Solar Sun World, LLC.

[Solar Sun World](#), headquartered in Madison, Georgia has over 15 years experience in the solar industry and has built the necessary relationships with component manufactures to define the system, coordinate the deliveries, and complete the installation within the time frame requirements of Hendrix. Aron Hendrix first met Solar Sun World in January 2010 and had a fully operational system, in May 2010. complete with web based monitoring software that measures power output and controls the tracking mechanism.



System Components

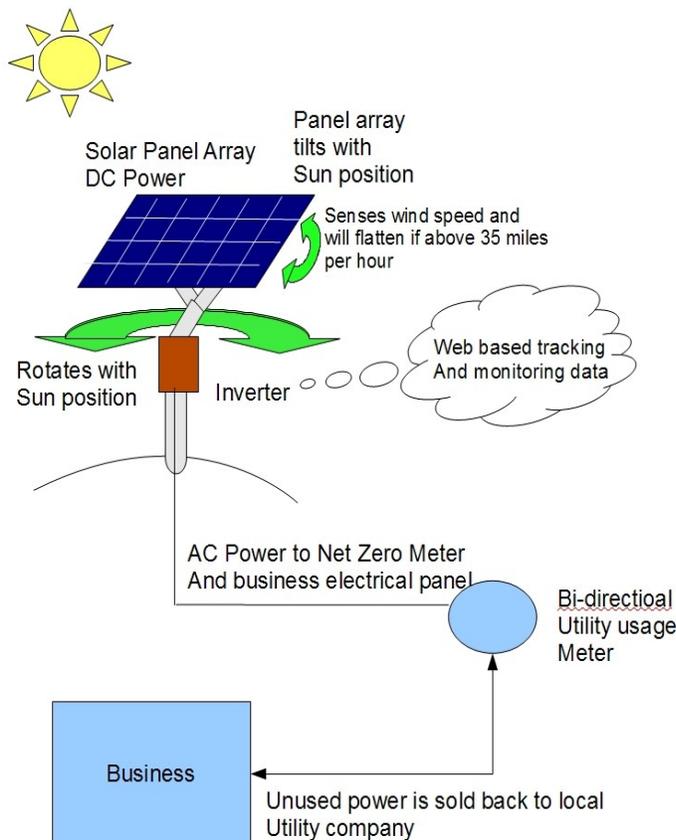
Aron had a few requirements for his system. It must generate enough power for both his business and his home and it should include local or USA manufactured products when ever possible. He wants the system to be fully functional well into the future, so quality and efficiency were utmost in his mind.

As tracking systems can produce up to 40% more power than a fixed system, the decision to choose a dual tracking system was straight forward. Which one was just about as simple. Solar Sun World already had a relationship with one of the worlds highest quality manufactures of tracking systems. [sonnen_systeme Projektgesellschaft mbH](#), part of the Kirchner Solar Group GmbH, winner of the 2010 German Solar Prize for its efforts in photovoltaic and tracking systems, met the requirements for

quality and efficiency. With offices in Germany, Italy, Belgium, and the USA, it is the leader in the manufacture and distribution of solar tracking systems. The system, controlled by astronomic tracking software, developed in partnership with SMA Solar Technology, AG, tracks the sun's position, relative to the system's location, on a minute by minute basis and controls the position of the panel array automatically. The software has a web based user interface, which makes it possible for Aron to access his system from his laptop or mobile phone. Very convenient for this North Georgia entrepreneur who is always on the go.

With the mechanics of the system selected, choosing an inverter and power monitoring system was a critical decision. The logical choice was to choose an inverter from [SMA Solar Technology](#) which would easily integrate with the tracking system. The SMA unit selected was the [SUNNY BOY SB 8000-U,S](#) selected for its wide deployment in the field and its high performance design which results in a 96% CEC weighted efficiency. The monitoring software for this system is also accessible through a web based interface. Again, most convenient. SMA Solar Technology's US operations, SMA America, is based in Rocklin, California.

The ongoing efficiencies of the overall system also depended on selecting a high-efficiency, high-powered solar panel. Keeping Aron's buy local philosophy in mind, Solar Sun World selected Suniva®, a leading monocrystalline cell and solar panel manufacturer, located just a few miles from the installation site. The ART245-60 Monocrystalline Solar Panel is engineered with industry-leading U.S.A. technology and provides excellent value, performance and quality. With deep roots in PV technology, including more than 20 years of proprietary cell research and design, Suniva® is a global leader in the high-efficiency, low-cost solar products market. To achieve the power requirements of 50+ kilowatts of power per day a total of only 36 panels were necessary making Suniva a compelling fit for Aron's requirements.



Once the system was defined, Solar Sun World, coordinated the delivery of the components, and handled the installation of the overall system. As the completed system was a grid tied system, any surplus power is feed back to the local power company.

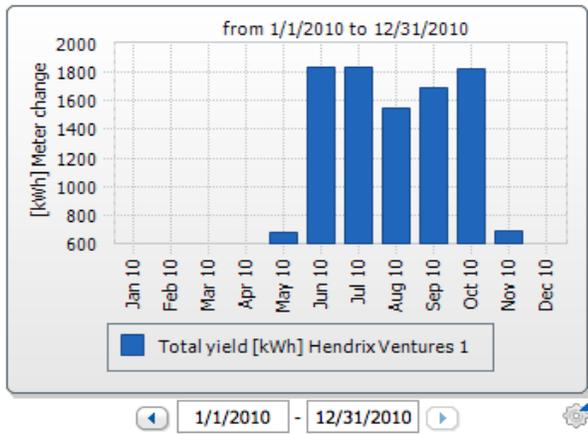
To date the system has generated 10,987 kWh , averaging 59 kilowatts per day for a dollar value of almost \$1200. The CO2 reduction of 7,634 kg, is a major contribution by one individual.

System Financials

One factor in the decision making process was whether to choose a fixed panel system or a tracking system. With performance levels of the dual tracking system being 40% greater than a fixed system and the availability of a wide open space, the choice was clear to Hendrix. The additional cost of a tracking system was

justifiable due to the increase in production. The completed system totaled \$69,000. With the federal incentives of a 30% rebate for businesses and state tax credits, and a rebate of \$2600 from his power company, Hendrix was able to get the cost down to approximately \$22,000. Taking the value of the electricity generated to date (\$1144 for 6 months) and projecting it out over a year to \$2300, the ROI for this system is 8 years and 7 months. As rates for electricity rise, that time frame will decrease. As a major capital expense, Hendrix can also depreciate the system over time, thus reducing his business's tax liability even further.

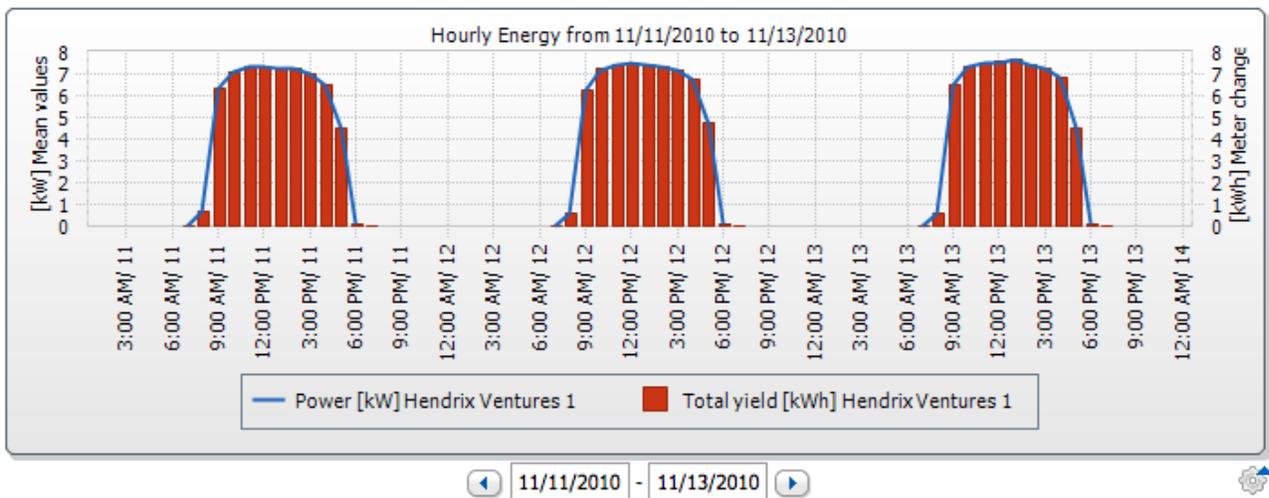
System Performance



Upon completion of the system in late May, Hendrix saw immediate results. May saw the production of over 600 kWh, June's production exceeded 1800 kWh. Production has been in that range consistently. August and September had several overcast days which cut production somewhat, but still were well within target production rates.

The hourly production shown in the chart below shows a fairly predictable trend in daily production on a few sunny days in November. With this level of production and consistency in the winter months, Hendrix is assured of the year round performance.

Power Produced: May through early November



Daily Production Rates

To view real time data statistics, follow this link to the [Sunny Boy Monitoring Portal](#).

Aron Hendrix had a mission to exemplify his commitment to conserving our resources, utilizing renewable energy sources and contributing to the local economy. Building this system certainly accomplishes those objectives and leaves a clear statement of his philosophy for his children, grandchildren, and community.