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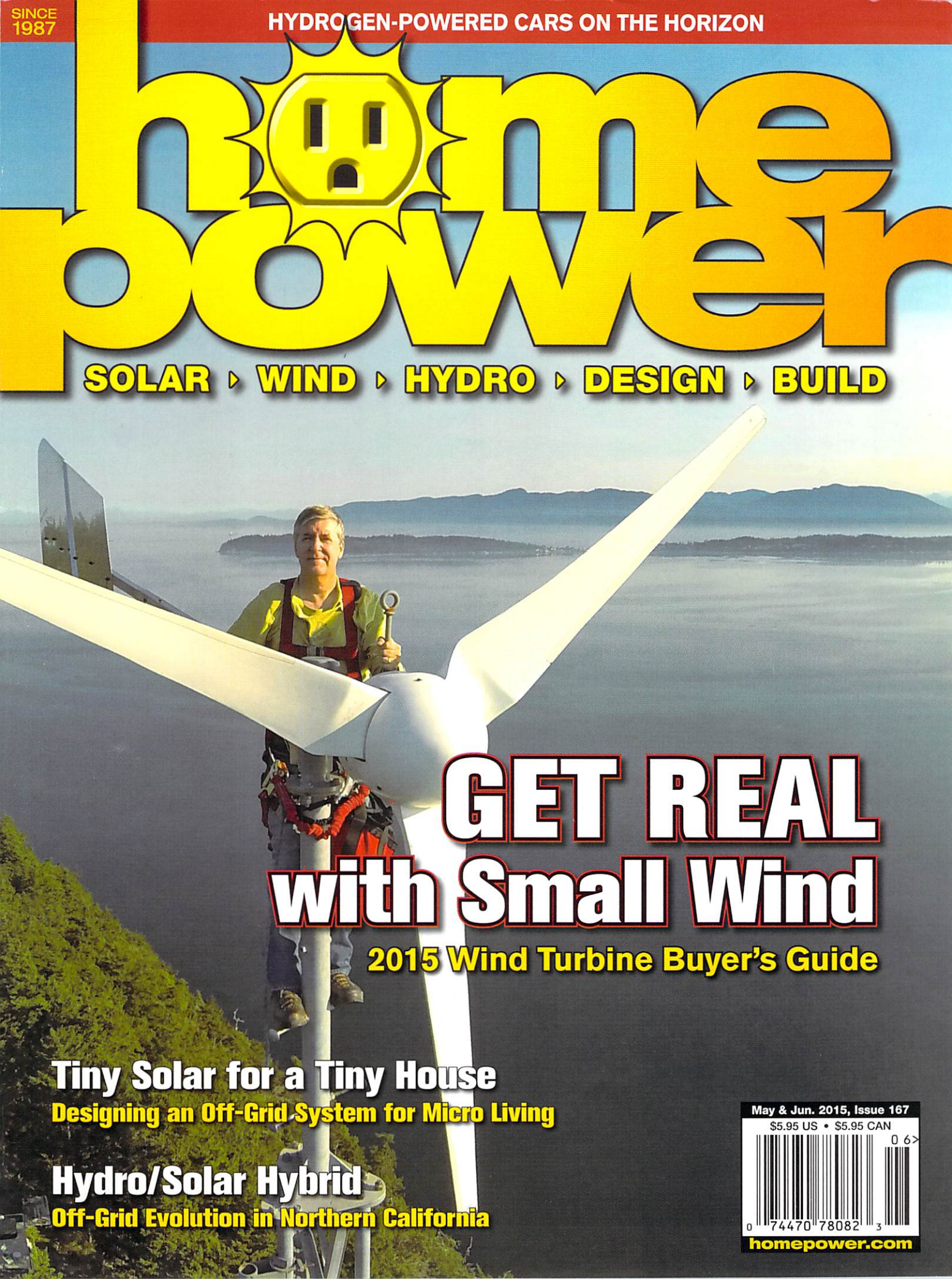

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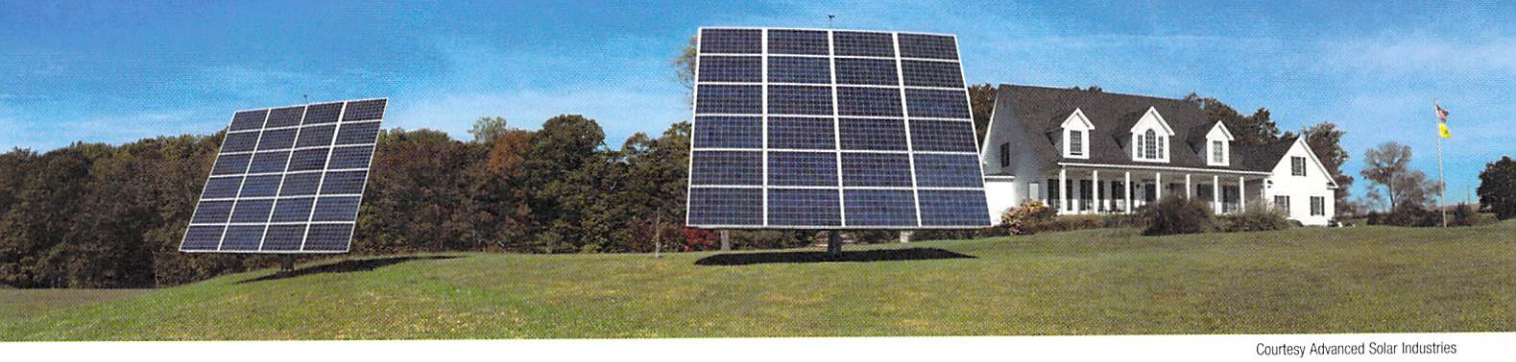
Solar Trackers: Big Output from a Smaller Footprint



Courtesy Advanced Solar Industries

Maryland homeowner Tom Lomax was looking for a solar solution that would not take up too much room, but would meet his household's annual energy consumption. A rooftop installation was ruled out—the south side of his home's roof had dormers, making it difficult to avoid significant loss of power from shading. That narrowed the choice to a pole- or ground-mounted system.

Although he had other estimates for ground-mounted systems, it was Pennsylvania-based Advanced Solar Industries' (ASI) proposal—two arrays on dual-axis trackers—that caught his attention. Not only would the arrays fit in a smaller area than a ground-mounted array, but they would produce more energy, bringing his home to net-zero energy use.

The entire AllEarth Renewables tracker assembly was pre-engineered and arrived on a single pallet. The Series 24 AllEarth Solar Tracker is a dual-axis active tracker that uses a hydraulic system to keep the modules perpendicular to the sun's rays. The tracker, powered by a 208 or 240 VAC electric supply, uses less than 1% (between 50 and 90 kWh) of the array's annual production. At this site, compared to a fixed array of the same size, the installer estimates an increased production of about 1,600 kWh per kW (more than 30%).

The concrete bases for the trackers were precast and, after the ASI crew dug holes for each tracker, lowered in with a forklift. The mast was anchored to the base with four 1-inch, threaded rods and nuts, and direct-tension indicator washers. The tracker racks were assembled on site.

Each tracker is equipped with GPS and wireless technology to accurately position the arrays with the sun, and send and receive data. Anemometers atop each tracker measure wind speed and activate the tracker's automatic stow function during high winds.

Tom uses a wireless router cellphone hotspot with a Sunny Web Box to send tracker and inverter production data to the SMA America Sunny Web portal. Sunny Boy inverters were used because Tom may eventually incorporate battery backup using SMA Sunny Island inverters to provide electricity during grid outages.

"I moved into my new home on the family farm in 2009, and for five years dreamed of having solar," says Tom. "My motivation was driven by both environmental awareness and the desire to invest in a system that would counter the ever-increasing costs of energy."

—Andrew Savage

Overview

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Project name: Lomax residence
System type: Batteryless grid-tied
Installer: Advanced Solar Industries
Date commissioned: October 3, 2014
Location: Bel Air, Maryland
Latitude: 39.6°N
Solar resource: 4.7 daily peak sun-hours
System capacity: 12.24 kW STC
Average annual production: 19,600 AC kWh
Average annual utility bill offset: 100%

Equipment Specifications

PV modules: 48 Conergy PE255P, 255 W STC each
Inverters: Two SMA America SB6000 US, 6 kW each
Array installation: Two AllEarth Solar Trackers