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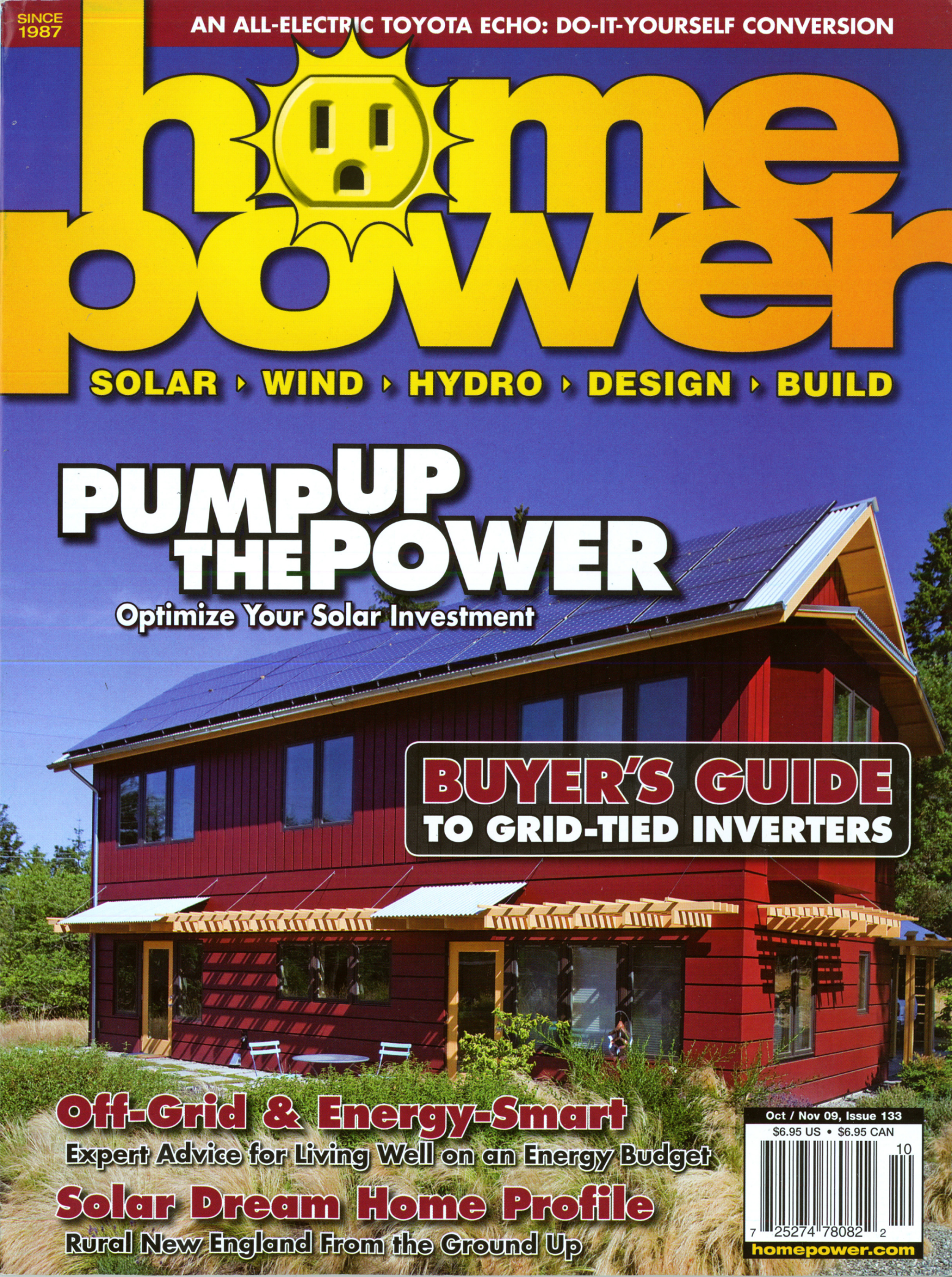

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This Bainbridge Island, Washington, home maximizes PV coverage of south-facing roof area. To avoid shading and simplify the layout and rack system, chimney and other roof penetrations are concentrated on the north roof.

Lowering the Cost of Grid-Tied PV Systems

by Brian Mehalic

Solar-electric systems are becoming more common on homes, businesses, and as large generating facilities. This is partially due to increased incentives and rebates available, which help reduce system costs. However, while it may not be an apples-to-apples comparison, the fact remains that PV-generated electricity can be 1.5 to 4 times the cost of the typical, fossil-fuel-dominated utility blend.

The price per kilowatt-hour (kWh) for a PV system is calculated by dividing the system cost by its estimated lifetime energy production. One way to reduce the cost per kWh is to maximize the energy the system produces. Of course, the benefits of PV-generated electricity go far beyond the system's initial cost: Each clean kWh produced by a PV system can displace a kWh that would be produced by conventional (polluting) energy sources. So wringing as much production as possible from your PV system makes good sense financially *and* environmentally.

PV modules typically have warranties of 20 years or more, and expected operational lives of more than 30 years. Over this time, a small amount of lost energy each day can add up to significant losses. Poor installation practices can result in increased maintenance, added downtime, and even greater losses. Fortunately, there are opportunities to optimize performance throughout the design and installation process—and lower the cost per kWh.