



THE ENERGY-SMART HOUSE



From the Editors of Fine Homebuilding

BUILDER-TESTED | CODE APPROVED

THE ENERGY- SMART HOUSE

FROM THE EDITORS OF **Fine Homebuilding**[®]



The Taunton Press

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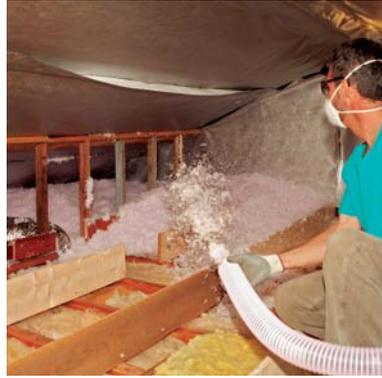
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Except for new page numbers that reflect the organization of this collection, these articles appear just as they did when they were originally published. You may find that some information about manufacturers or products is no longer up to date. Similarly, building methods change and building codes vary by region and are constantly evolving, so please check with your local building department.

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CONTENTS



Introduction	3
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PART 1: ENERGY EFFICIENCY

Every House Needs an Energy Audit	4
Home Remedies for Energy Nosebleeds	12
Can a Vintage Home Be Energy Efficient?	20
Efficient Houses Need Fresh Air	30
A Practical Look at Deep-Energy Retrofits	39

PART 2: INSULATION

Upgrade Your Attic Insulation	46
Beef Up Your Old Insulation without Tearing into Walls	56
All You Need to Know about Spray Foam	65
Making Sense of Housewraps	70
Using Rigid Foam for an Efficient and Dry House	79
Basement Insulation Retrofits	82
Weatherstripping	85



PART 3: WINDOWS

A Buyer's Guide to Windows	91
Do Europeans Really Make the Best Windows?	104
Installing Replacement Windows	110

PART 4: HEATING AND COOLING

Is Your Heating System an Energy Beast?	118
Finding the Sweet Spot: Siting a Home for Energy Efficiency	128
Cool Design for a Comfortable Home	136
Central Air-Conditioning: Bigger Isn't Better	145

PART 5: LIGHTING AND APPLIANCES

Low-Energy Lighting, High-Energy Design	151
The Bright Future of Lighting	159
The Energy-Smart Kitchen	165
Solar Hot Water	174
Energy-Saving Thermostats	182
Credits	185
Index	186

INTRODUCTION

If there is one topic that has dominated the homebuilding field in recent years, it's energy efficiency. But for all the headlines and airtime dedicated to the topic of trimming home-energy use, many of the discussions they generate don't go any further than the admission that, yes, we need to work harder to save energy where we live.

What we really need to talk about is *how*.

At *Fine Homebuilding* magazine, we focus not only on what good, responsible builders should do to construct or remodel homes that don't waste energy, but also on *how* they do it. This book explains how you can, too.

In *The Energy-Smart House*, you'll be able to follow these builders step-by-step through critical energy enhancements that include air-sealing, insulation upgrades, and window replacement, as well as choosing the best low-energy fixtures and appliances.

Today, the opportunities for reducing the energy requirements of the homes we live in—no matter how old they may be—are tremendous. The evolution in building products alone, from housewraps to LED lighting to high-performance windows, has equipped builders with a wide array of options to make homes more durable and healthier as well as less costly to live in and maintain. Ever-advancing technologies enable new mechanical systems to deliver heating, cooling, and hot water more effectively and at a lower cost. All the while, a greater understanding of building science enables knowledgeable builders to craft efficient, long-lasting dwellings regardless of the climate in which they build.

The fact is, true energy efficiency can only be achieved through a multifaceted approach that takes the whole house, its site, structure, and systems, into account. A home is not made “energy efficient” by popping in a few new windows or loading up the attic with cellulose. Good builders know the path to energy efficiency is a multistep process, and that each improvement influences the steps that follow. And that the conscientious application of smart building techniques like the ones found here is the most reliable roadmap they can follow in their pursuit of an energy-smart home.

Debra Judge Silber, Managing editor,
Fine Homebuilding magazine

Every House Needs an Energy Audit

■ BY JEFFERSON KOLLE

In the bill from her gas company, Leslie MacKensie of Minneapolis learned that she could have a free energy audit performed on her house, so she made an appointment. After assessing the 1915 bungalow, the auditors showed her air leaks and other problems that resulted in a monthly bill of \$110. The auditors left her with weatherstripping and foam-insulation pads to install, along with a list of other needed improvements.

Chipping away at the list has had dramatic results. Even after she expanded her home with a small addition, her current gas bill averages only \$80 a month. “Almost as important,” she says, “is that now our home is really comfortable to live in all year round.”

Home-energy auditing—the process of diagnosing and recommending improvements to reduce a house’s energy consumption—is not a new idea, but the reasons to get an audit are more pressing as concerns about costs, comfort, personal health, and the environment loom large.

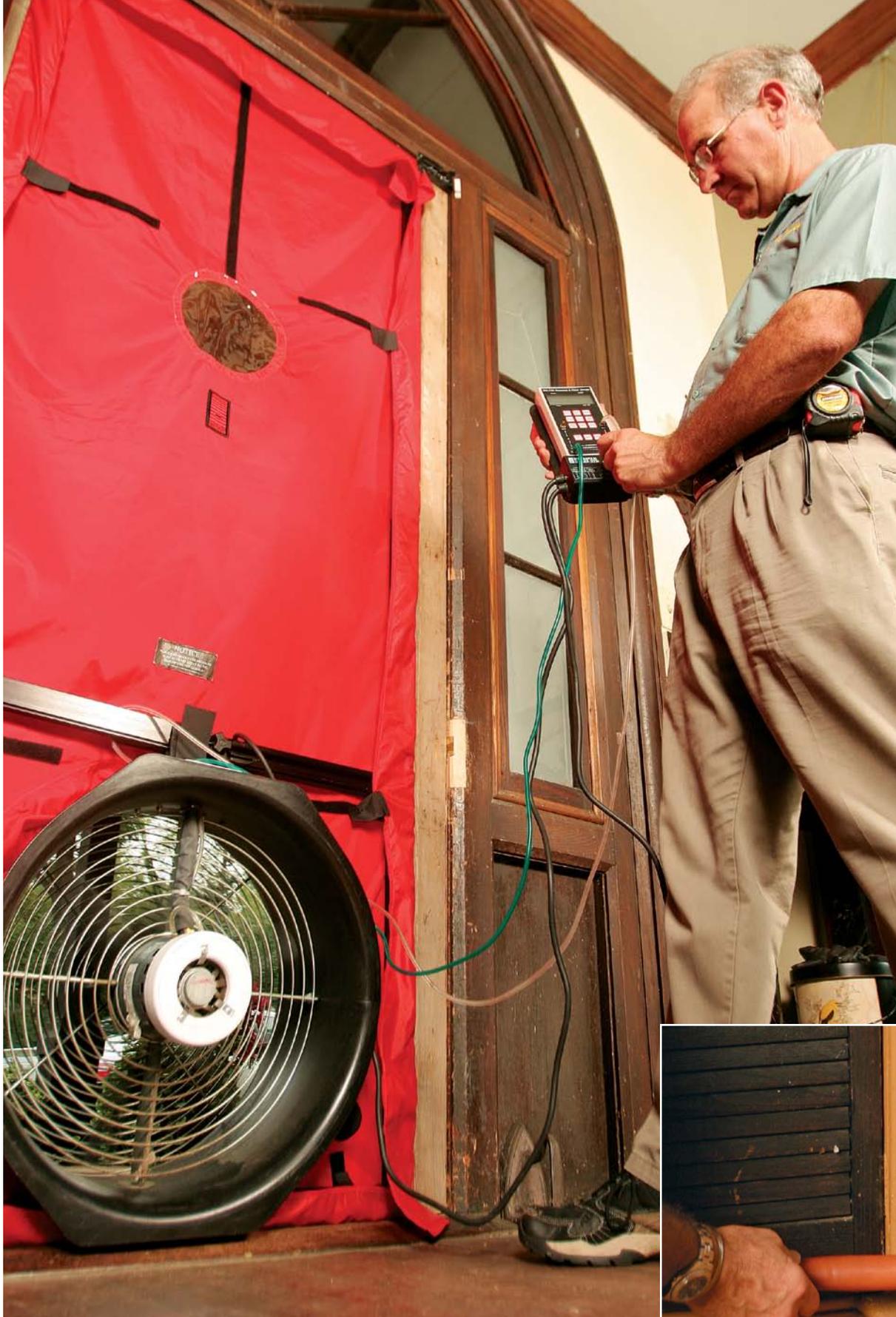
Along with free or reduced-cost audits offered by utility companies, an increasing number of private companies perform

audits. And while an old leaky house might be the obvious choice for an energy-waste diagnosis, new houses can benefit, too. The results can be an excellent marketing tool for builders and can help homebuyers qualify for an energy-efficient mortgage, which uses energy-cost savings to lower debt-to-income ratios.

The most important thing to note about energy audits, however, is that they don’t save money or energy. Implementing the recommended improvements is how the savings happen.

There Are Two Types of Audits

Energy audits vary in complexity from an unscientific but learned assessment to one that uses an assortment of diagnostic equipment to measure the performance of a house and its systems. The unscientific assessment typically consists of a thorough two- to three-hour walk-through, during which the auditor makes a visual inspection; takes photographs; and records information about the



Locating leaks. One of the most valuable scientific tools an auditor can use is a blower door, which is mounted temporarily on an exterior-door frame. The blower door's calibrated fan pulls air through the building, measuring the amount of air leaks. While the fan is operating, an auditor uses a smoke stick to locate the leaks. Smoke pulls away from the leaky spot and toward the blower door.