

The Smart Guide to
Geothermal

**How to Harvest Earth's Free Energy
for Heating & Cooling**

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Foreword by Michael Hunt

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Preface

The next generation of home heating/cooling is here! I can even foresee traditional oil burners and gas boilers becoming nearly obsolete in the future. I'm pleased to say there is an excellent alternative to fossil-fuel burning, home-heating systems and it is the geothermal heat pump.

The primary purpose of this book is to spread the word that if you are planning the construction of a new home, or have an older, aging oil or gas burner, you would be wise to consider a ground-source geothermal system. But even homeowners who have fairly new oil or gas systems are retrofitting with geothermal heat pumps, due in part to the rising price of fuel and the possibility of having zero fuel costs in the future as well as the increased value of their homes. Builders and architects should also consider how this technology can positively impact their projects. With substantial incentives available (thanks to the American Recovery and Reinvestment Act of 2009), now is the time to implement this smarter approach.

The immediate driving force behind geothermal is saving money, year after year. Added to that is the benefit of reducing our need for foreign and domestic oil, and the reduction of pollutants in the air.

As a homeowner or small business owner, your first step should be to do your homework to learn more. You have in your hands right

here a survival kit; a complete picture of everything you need to know about ground-based geothermal systems. My goal is to make you a well-informed homeowner on the subject of geothermal heat pumps (GHP) and to encourage you to implement this technology in your own home.

The key to a successful geothermal system is in the installation.

There are many certified, qualified and experienced contractors out there and new installers are continually coming into the field, but their supply is not keeping up with the industry's growth. Official US standards exist for the *hardware* in terms of quality, safety and performance, but there are no officially approved national Air-Conditioning, Heating and Refrigeration Institute (AHRI) *installation* standards as of 2010. In the interim, the International Ground Source Heat Pump Association (IGSHPA) provides an installation standard that is used for accreditation training of installers in the United States. Canada already has C448 in place as an official installation standard. This puts the responsibility on the homeowners to be knowledgeable about this technology so that they are in a more comfortable position to select a competent contractor/installer and to work with them as discussed in *Chapter 15: Finding a Contractor*. It is not an overwhelming task for a homeowner, yet it is very important.

Installing a geothermal system in my new home was one of the smartest decisions I ever made! This book will make you far better equipped to make your own decision. It is organized into three parts:

Part I—The Big Picture is a general description of geothermal heat pump systems (including my personal experience), the advantages, disadvantages, costs, payback time and increased market value of the home. This section also covers finding a contractor, gives examples of homes with installed geothermal systems, living with a GHP system, and much more.

Part II—Unraveling the Science and Technology goes into slightly more technical depth in describing the flow of heat from the ground to the house, the “magic” of the compressor, how 400–500% efficiency is obtained, and how the Laws of Thermodynamics come into play. Homeowners, GHP manufacturers and installers will especially welcome chapters 16 and 17 that go deep inside the heat pump to clearly explain why it works.

Part III—The Broader View portrays a broader picture of the geothermal world and discusses future trends. It also includes *The Ultimate Geothermal Package* where I go out on a limb to tie together all of the information in the book and present my idea of what I believe to be the ideal ground-based geothermal heat pump solution and why.

The appendix includes references and links to other geothermal websites and state energy offices, plus a listing of companies that manufacture ground-based residential geothermal heat pumps in the United States and Canada. For those interested in joining the geothermal industry, a career section is also included.

This book starts out locally (a few feet below the ground in our backyard) and ends with a global outlook—all with the same goals of lowering heating costs, reducing pollution with renewable sources, and creating energy independence.

I would like to thank Michael Hunt, a long-time professional in this geothermal business, for contributing his knowledge and experience. I think you’ll be pleased with the result—an unusual synergism that provides an ideal basis for making your own decision about geothermal.

Don Lloyd
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