Preface

This book is a fusion of ideas, information, advice, and opinions from the authors, their colleagues, and dozens of other sources, brought together to provide you with the tools and insights you'll need to maximize your success in a new era of socially responsible engineering.

The information in these pages will be most relevant to engineers who design and build "things"—engineers in fields such as electronic/computer engineering, software engineering, mechanical engineering, materials engineering, automotive engineering, and so forth—although we believe engineers in all disciplines, managers of engineers, and even consumers will find useful information in this book. We've divided the book into four parts.

- **Part I: Advent of the Citizen Engineer** defines "Citizen Engineer," describes the trends that have led us to this new era of socially responsible engineering, and discusses what it all means—to engineers, to businesses, and to our society.

- **Part II: Environmental Responsibility** provides practical "how-to" information and resources to help you minimize the environmental impact of the products and services you're designing. It gives you an overview of what you need to *know*, things you need to *consider*, and what you need to *do* as you create ecologically and economically sound products, including (to name just a few topics)

    - Understanding and calculating the complete impact of a product or service

    - Defining strategies for key impacts such as greenhouse gas (GHG) emissions and water usage

—Trends in environmental regulations

—Whether "carbon neutrality" is sufficient as a business goal

- **Part III: Intellectual Responsibility** includes basic information about patents, copyrights, trademarks, trade secrets, nondisclosure agreements, standards, and licenses—and offers practical advice about how to maximize the economic opportunities intellectual property (IP) law presents while avoiding the potential pitfalls. For example, we discuss

    —The role of patents and when and how to file them

    —How to encourage other engineers to adopt and amplify your ideas

    —Pros and cons of various software licenses

    —Whether our system of IP controls maximizes innovation fairly

    —How to build communities to innovate and amplify your ideas

- **Part IV: Bringing It to Life** takes a look at some of the ways engineers—and engineering schools—are responding to the new realities and requirements of the new era, including

    —The growing momentum behind broader curricula in engineering schools

    —Advice for recent graduates and newly hired engineers

    —Examples of interesting projects with which Citizen Engineers are involved worldwide

You'll notice that the greatest emphasis falls on two broad topics that may not seem to be natural bedfellows: eco responsibility and intellectual property law. The reason is simple: These subjects have the greatest urgency to engineers today. They are redefining the way engineers do their jobs, yet most engineers are just beginning to understand the full impact each brings to bear on their work.

The book combines facts and viewpoints, and we've tried to be very clear about which is which. The subjects we discuss in each section can get enormously deep, so we've tried to give you enough basic understanding, along with pointers to further information, that you'll be able to continue exploring each topic. We hope you'll find the book useful in structuring your thinking and answering key questions.

Finally, a few notes about the book itself. Two of the key topics are environmental responsibility and intellectual property. Since the book will have physical manifestations and since it is, by definition, intellectual property, we've spent some time thinking about how this book lives up to the ideas it espouses.

First, let's look at the environmental impact of the book. If you're reading these words on a printed page, you're charmingly old-fashioned. This book is available in three forms, and only one of them is printed at all. We recognize the pleasures of reclining in a comfortable chair to read a book—but we also recognize the need to diminish the negative environmental impacts of traditional books. The publisher of this book, Pearson, has developed its own procedure to track wood back through the production process to the original forest, allowing the company to verify the sustainability of the papers it uses. Pearson also measures the carbon footprint relating to the shipping of its printed books around the world. The reuse/recycle rate for Pearson's unsold books and newspapers was 99% in 2007, in excess of the company's target of 95%. Pearson regularly reports on its progress to the United Nations as part of the company's commitment to the Global Compact.[1]

Our book is also available digitally. You can download it from a number of sources, and we hope you've taken the opportunity to acquaint yourself with the unique advantages of reading a book online: Digital versions are easy to scan; you can search for specific words or phrases; you can annotate and highlight electronically; and you can change the font size (those of us who are over age 40 appreciate this feature in particular).

Next, let's talk about the intellectual property that this book entails. By writing the book in the United States, we automatically get the privileges of copyright. In addition to the copyright, we have decided to license the content under a Creative Commons license, namely the Attribution-Noncommercial-Share Alike 3.0.[2] This means you are free to *share* this book (copy it, distribute it) and *remix* it to make derivative works under the conditions that your copies or remixes are for *noncommercial* purposes, that you provide proper *attribution,* and that you *share alike* any changes you make under the same (or a similar) license.

Finally, we have made every effort to properly recognize the works of others that we have leveraged in the writing of this book. If we've borrowed a line or a paragraph from someone's article or book, we've cited the source and referred you to the complete text. If we've used a resource such as Wikipedia to help us define a term or provide statistics that support our point, we have attempted to verify the accuracy of the content and cite the original source of the information.

One additional form of the book is interesting as it embodies both eco responsibility and intellectual property: We're making the book available as part of a living Web site (www.citizenengineer.org). We want you to do more than read the book; we want you to contribute to it. Add your thoughts about the new era of socially and environmentally responsible engineering. Insert your advice and lessons learned. Give the community tips for developing an

environmental impact study. Got a better way to measure the carbon foot-print of a new device? Have some new information about an energy regula-tion? Let everyone know. This is a community effort; we welcome your participation.