Today, the world is witnessing exponential growth in computing devices. This growth in use has led to a major increase in electricity consumption worldwide, which in turn has resulted in increased demands for usable energy resources and increased emissions of carbon and other pollutants. Currently, 3% of the world’s energy supply is consumed by computing devices, accounting for 3% of the CO$_2$ emissions worldwide. These numbers are forecast to continue to increase as the use of computing devices becomes even more pervasive. Due to the ongoing challenges associated with providing adequate energy supplies and with energy generation’s environmental impact, the greening of energy supplies, the adoption of renewable materials of construction, and the reduction in energy consumption are now increasingly important and should be a key goal for all who research and design computing devices.

This book is a valuable addition to academic and research libraries and a solid resource for engineers, researchers, scientists, students, and educators involved in information technology, computer science, electrical engineering, and mechanical engineering. It will also be useful reading for anyone interested in learning more about the growing field of Green Computing.

The book is a collection of current cutting-edge research techniques, trends, and practical applications in the field of Green Computing. In the books’ chapters, you will find descriptions of state-of-the art research projects on the many aspects of power-aware computing, such as components, software creation and production, system levels, networking, and data centers. The topics address different areas, including data centers, networking, communications, software systems, and computer and component design.

The goal of the book was to compile research contributions, constructive debates, and the results of prior case studies related to energy conservation and carbon emission reduction for computing while also offering future research directions and positive steps that can be taken to reduce energy consumption, and therefore minimize carbon emissions, lessen pollution, and slow climate change.

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in the environmental impacts of coal and methods to increase coal use sustainability. An Arizona native, Dr. Seames received his BS in Chemical Engineering at the University of Arizona in 1979. After a 16 year industrial career as a Process Engineer, Engineering Supervisor, and Project Manager, Wayne returned to Arizona and earned his Doctorate in Chemical Engineering in July, 2000. Among his academic awards are the 2012 University of North Dakota Award for Excellence in Collaborative Scholarly Activity, the 2007 University of North Dakota Award of Individual Excellence for Research, the University of North Dakota School of Engineering and Mines 2006 Professor of the Year and 2004 Olson Professor for outstanding research, and the University of Arizona School of Engineering and Mines 1998 Faculty Award of Excellence at the Student Interface recognizing his teaching and advising contributions to the Chemical Engineering Department.