

THE  
CARBON  
CHARTER

*blueprint for a carbon free future*



Godo Stoyke

## ADVANCE PRAISE FOR

### *The Carbon Charter*

During a time when municipalities are both insolvent and crumbling under the weight of short-sighted assumptions, Godo brings forth an attainable green vision for municipal leaders to create effective change with. We know that the majority of our municipal leaders have acted responsibly and seek to embrace our challenging future; here is one of the keys to that future. Godo Stoyke raises the bar again.

- *Joey Hundert, social entrepreneur, Philadelphia, PA*

The *Carbon Charter* is an invaluable resource for local governments that want to lower their carbon footprint. It is an excellent source of best practices, and is organized in a manner that facilitates technology transfer. Godo Stoyke has developed a wonderful how-to guide based on the leading carbon reducing efforts in the world from local and state governments.

- *Roger Duncan, Austin Energy*

The roots of the *Carbon Charter* are growing in hope and in the fertile compost of communities all over the world creating bold, local solutions. Godo Stoyke gives the challenge of carbon reduction the flavor of a treasure hunt. The invitation to join is irresistible.

- *Rob Harlan, Executive Director*

*Solar Energy Society of Canada — Northern Alberta Chapter*

PRAISE FOR GODO STOYKE'S

*The Carbon Buster's Home Energy Handbook*

This book offers real solutions for reducing our energy use and helping our environment.

- *Doug Anderson, ENERGY STAR program,  
US Environmental Protection Agency*

For all of us who want to reduce our environmental impact and save money, here is the invaluable, practical resource we've been looking for. If you are concerned about global warming, rising fuel costs, or the world we will leave our grandkids, read this book and tell your friends.

- *Alexis Karolides, Rocky Mountain Institute*

At last, a book written in plain English that guides you step by step through the best choices to make for reducing both energy costs and carbon emissions at a family level.

- *Richard Freudenberger, publisher, BackHome Magazine*

This book is a *Clear* can come true for anyone who wants to reduce their carbon emissions in the most cost-effective way.

- *Guy Dauncey, author of The Climate Challenge:  
101 Solutions to Global Climate Change*

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CARBON  
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Guido Stoyke

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*This book is dedicated to my brother,*

*Asmus Stoyke,*  
*the best brother in the world*

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I would also like to thank all those dedicated individuals around the world who work tirelessly for creating a more sustainable world and who have created the innovative and farsighted policies described in this book.

Finally, I would like to especially thank my lovely and talented wife and business partner, Shanthu Mano, and my amazing son, Calan, now nine, for being who they are!



## PREFACE

SINCE 1992, GODO STOYKE AND HIS TEAM AT CARBON BUSTERS have utilized their unique capacities in applied research, modeling, design, architecture, and education in order to facilitate a transition to sustainability for institutions, businesses, and homeowners alike. Carbon Busters have been in the vanguard for ecologically and climatically appropriate development, being amongst the first groups in North America to achieve true Zero Carbon design specifications.

My own relationship with Carbon Busters began during my campaign to become elected as a City Councillor for Leduc, Alberta. I had identified that social, economic, and environmental sustainability is of paramount importance for effective leadership and city planning. Therefore, I sought out Godo to help enrich my depth of awareness in how to apply sustainable principles on the municipal level. The topics and issues surrounding sustainability provoked passionate conversations with the citizens of Leduc as my campaign pressed onwards. Clearly, topics such as recycling, efficient transit, the future of energy, conservation of lands, waste/stormwater management, habitat restoration, food security, and long-term community well-being were on the minds of my

constituency. I attribute my election success to having focused my campaign on matters of sustainability in Leduc.

However, that is not to say that forwarding sustainability at the municipal level has been easy or will become easier without help. Different perspectives have questioned the need for change, and peers have raised the risks associated with new responsibilities and new planning models. Converting sustainable municipal development theories into implementable actions has been the key to our success in Leduc. I have utilized Carbon Busters' research, design, and perspectives in order to arrive at such actions — that was the topic of my early conversations with Godo. Godo has truly understood the needs of leaders on scales ranging from the community to the nation. The solutions given in *The Carbon Charter* are crafted from examples in recent history from around the globe — and the simplicity of some of these solutions can be staggering.

Precedent is important in municipal affairs; therefore, preceding successes in sustainable development are crucial. However, pioneering work in greening our cities is inevitably subject to the vast array of conditions and settings that we may find ourselves in. To this end, Carbon Busters has provided a framework for determining and tailoring new solutions as well.

This is a seminal work, and I am deeply grateful to Godo and the Carbon Busters team for providing such vital information to leaders likely to do extraordinary things with it in order to green the spaces and structures we live in.

- Dominic Mishio, City Councillor, Leduc  
September 15, 2008



# INTRODUCTION

**T**HIS BOOK IS DESIGNED TO GIVE MUNICIPAL COUNCILLORS AS well as state, provincial, and federal legislators quick access to some of the world's best sustainable city ordinances, bylaws, and acts.

Rather than reinvent the wheel, why not make use of the ingenuity and hard-won experience of other jurisdictions from around the globe?

This volume describes government initiatives that are particularly innovative and effective in creating a sustainable world and in moving us closer to a carbon-free society.

As the stories and examples in this book powerfully demonstrate, cities by themselves can remake the planet into an engine of sustainability that largely eliminates the driving force behind climate change.

With a little help from federal and regional governments and the support of green industries from around the globe, these initiatives support the notion that it is entirely doable, if not exactly trivial, to move to a carbon-free future in less than ten years.

Each section in this book contains resources for in-depth study as well as a "QuickLink." QuickLinks point to the book's companion website [CarbonCharter.org](http://CarbonCharter.org), where readers find updates, original files, and updated pointers for stale web links.

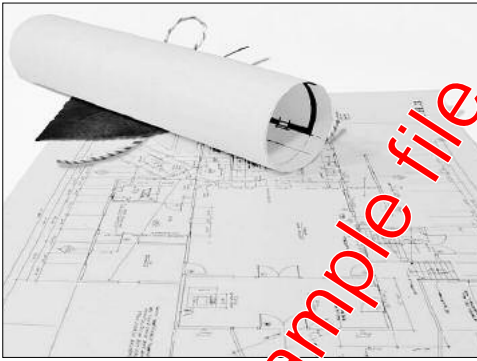
## 2 THE CARBON CHARTER

### Companion Website and QuickLinks

*For updates, free downloads, and updated links to original legislative and support documentation visit [CarbonCharter.org](http://CarbonCharter.org) or enter the short and convenient QuickLink URL for extra content.*

**char·ter** (chär't\_r) noun

1. declaration of fundamental values and principles
2. a statement of the scope, objectives and participants in a project



DENISE DAHL

Sample file



# THE STATE OF THE PLANET

**I**N 2000, KOFI ANAN, THEN SECRETARY GENERAL OF THE UNITED Nations, proposed the undertaking of the Millennium Ecosystem Assessment. It was cochaired by Robert T. Watson, Chief Scientist of the World Bank, and A.H. Zaki, Director of the Institute of Advanced Studies of the United Nations University. The four-year study was released in 2005 after the input of 1,360 experts from 95 countries. Its purpose was to assess the changes in ecosystems over the course of past decades and to project changes into the future. It is considered one of the largest studies of the Earth's natural systems ever undertaken.

## **Declining Ecosystem Services**

*“Nearly two thirds of the services provided by nature to humankind are found to be in decline worldwide. In effect, the benefits reaped from our engineering of the planet have been achieved by running down natural capital assets. In many cases, it is literally a matter of living on borrowed time.”*

- Millennium Ecosystem Assessment, 2005

NASA, © ARIS ENTERTAINMENT, 1994



Another source of detailed information of the current state of the world is the annual report of the United Nations entitled the “Millennium Development Goals Indicators.”<sup>1, 2</sup>

And finally, once a year, the Worldwatch Institute (worldwatch.org), releases a report that also reviews global environmental success stories and areas of concern for the 24 preceding months. Its latest publication is the *2008 State of the World* report.<sup>3</sup>

Here are some of the findings of these three reports:

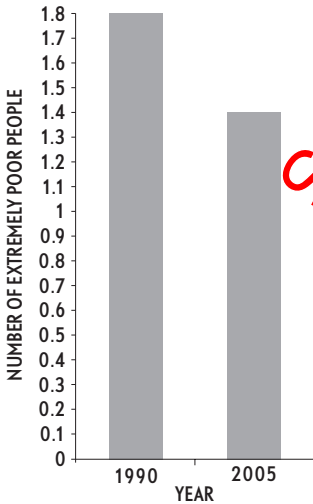
On the positive side of the balance sheet, the studies confirm that substantial net gains in human well-being and economic development have been made. In fact, a 2008 update by the World Bank shows that the number of extremely poor people in the world fell from 1.8 billion in 1990 to 1.4 billion in 2005 and that the proportion of people living below the poverty line fell

from 42% to 26% over the same period (Figure 2.1). At the current rate of change, the Development Goal of reducing extreme poverty by 50% by 2015 will be met (most of the change is attributable to China, while some sub-Saharan areas are faring worse).<sup>2, 4</sup>

Some other positive changes include the following:

- In all but two regions, primary school enrolment is at 90% or more.
- The Gender Parity Index in primary education is 95% or higher in 6 of the 10 regions.
- Some 1.6 billion people have gained access to safe drinking water since 1990 (Figure 2.2).

GODO STROYKE

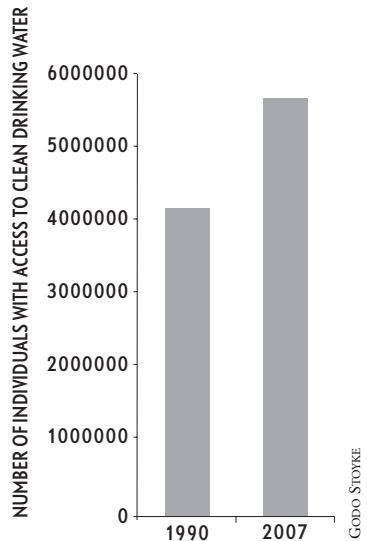


**FIGURE 2.1**  
The number of extremely poor people fell by 22% between 1990 and 2005.<sup>2</sup>

- The use of ozone-depleting substances has been almost eliminated, also contributing to efforts to reduce climate change.
- The share of developing countries' export earnings devoted to servicing external debt fell from 12.5% in 2000 to 6.6% in 2006.
- Deaths from measles and AIDS have declined, and malaria prevention is expanding.
- More people in developing countries have access to long-distance communication through the use of mobile phone networks.<sup>1</sup>
- Brazil reports that the rate of Amazon deforestation in 2006 slowed to half the level of 2005, the second lowest since record-keeping began in 1988.
- In 2007, an alliance of major US corporations and NGOs called for strong federal legislation to reduce greenhouse gas emissions.
- The bald eagle was removed from endangered species status in the US in 2007, reaching 9,789 pairs after a low of 417 pairs in 1963.
- Investments in renewable energy reached a record US\$100 billion in 2006.

However, the studies point out that environmental degradation and climate change may unravel the positive economic and health trends. These are some of the negative trends and outstanding problems:

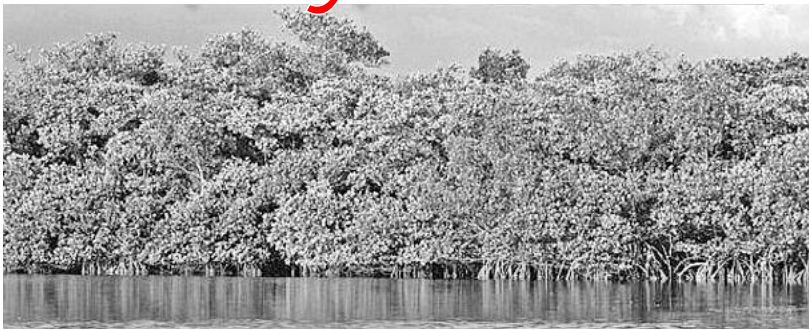
- Two billion people living in dry regions of the world are intensely vulnerable to the loss of ecosystem services, including water supply.



**FIGURE 2.2**  
An additional 1.6 billion people have obtained access to safe drinking water since 1990.<sup>3</sup>

## 6 THE CARBON CHARTER

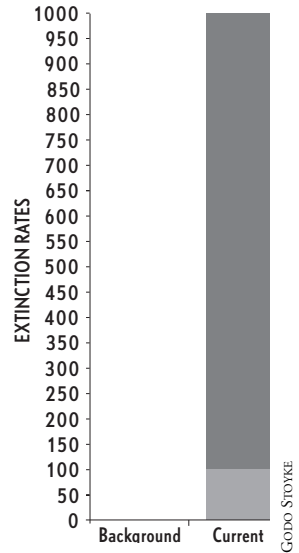
- There is a growing threat to ecosystems from climate change and nutrient pollution.
- 60% of world ecosystem services are being degraded or used in ways that cannot be sustained.
- Of 24 ecosystems evaluated in the study, 15 are being damaged.
- About a quarter of the Earth's land surface is now under cultivation.
- People now use between 40 percent and 50 percent of all available freshwater running off the land.
- Water withdrawals have doubled over the past 40 years.
- Since 1980, about 35 percent of mangroves have been lost (as well as providing various ecosystem services, mangroves play a vital role in protecting coastal areas and help provide a bulwark against storm surges, such as the 2004 Asian tsunami that killed over 225,000 people; Figure 2.3).
- About 20% of corals have been lost in just 20 years.
- Nutrient pollution has led to eutrophication (over-fertilization) of waters and coastal dead zones.
- Species extinction rates are now 100 to 1,000 times above the natural background rate (Figure 2.4).<sup>7, 8</sup>



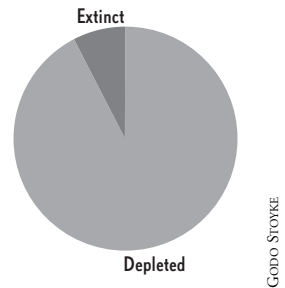
**FIGURE 2.3**

The value of Tampa Bay mangroves has been estimated at \$15,000 per acre (4,000 m<sup>2</sup>) for fisheries production, and an additional \$3,190 per acre for storm protection.<sup>6</sup>

- Carbon dioxide emissions have continued to increase, despite an international timetable for addressing the problem.
- International trade is still not favorable for developing nations.
- In one third of developing countries, women account for less than 10% of parliamentarians.
- More than 500,000 prospective mothers in developing countries die annually in childbirth or of complications from pregnancy.
- About 25% of all children in developing countries are considered to be underweight and are at risk of having a future blighted by the long-term effects of undernourishment.<sup>1</sup>
- Between 2004 and 2006 the number of low-oxygen “dead zones” in the world’s oceans increased from 149 to 200.
- Unusually low temperatures have led to record ozone loss over Antarctica, resulting in a record “ozone hole” of 11 million square miles (28 million km<sup>2</sup>).
- Scientists project that at current fishing rates, all currently fished species could collapse (90% depletion) by 2050 (Figure 2.5).
- The World Bank estimates that in 2006 natural disasters caused record damages of US\$159 billion.



**FIGURE 2.4**  
The extinction rate of plant and animal species due to human influence has increased by a factor of 100 to 1,000 compared to natural background rates.



**FIGURE 2.5**  
At today’s rates, 90% of global fish stocks currently harvested will be depleted by 2050.

## 8 THE CARBON CHARTER

Some of the general recommendations put forth in the Millennium Ecosystem Assessment include the following:

- Remove subsidies to agriculture, fisheries, and energy sources that harm the environment.
- Encourage landowners to manage property in ways that enhance the supply of ecosystem services, such as carbon storage and the generation of fresh water.
- Protect more areas from development, especially in the oceans.<sup>8</sup>

*“The challenge of reversing the degradation of ecosystems while meeting increasing demands for their services can be partially met under some scenarios that the MA [Millennium Ecosystem Assessment] has considered, but these include significant changes in policies, institutions, and practices that are not currently under way.”*

- Millennium Ecosystem Assessment, 2005<sup>9</sup>

### The Value of Ecosystem Services

Ecosystems provide many valuable products that are traded in the marketplace. These include fish and other marine foodstuffs, timber, fibers, and terrestrial food.

However, ecosystems also provide many services that are not traded in the marketplace. These include filtration of wastes and pollutants, regulation of the earth’s climate, protection from extreme weather, floods, land slides, fire, and disease, even from tidal waves (for example, East



**FIGURE 2.6**  
The Biosphere II project demonstrated the difficulty and great cost of artificially providing ecological services for even a handful of people.