

SUZUKI'S GREEN GUIDE

DAVID SUZUKI
& DAVID R. BOYD


ALLEN & UNWIN

First published in Australia and New Zealand by Allen & Unwin in 2009

First published by Greystone Books
A division of Douglas & McIntyre Ltd
2323 Quebec Street, Suite 201
Vancouver, British Columbia, Canada V5T 4S7

Copyright © David R. Boyd and David T. Suzuki 2008

Additional text for Australian edition by Michael Mobbs © 2009
www.sustainablehouse.com.au

All rights reserved. No part of this book may be reproduced or transmitted in any form or by any means, electronic or mechanical, including photocopying, recording or by any information storage and retrieval system, without prior permission in writing from the publisher. The *Australian Copyright Act 1968* (the Act) allows a maximum of one chapter or 10 per cent of this book, whichever is the greater, to be photocopied by any educational institution for its educational purposes provided that the educational institution (or body that administers it) has given a remuneration notice to Copyright Agency Limited (CAL) under the Act.

Allen & Unwin
83 Alexander Street
Crows Nest NSW 2065
Australia
Phone: (61 2) 8425 0100
Fax: (61 2) 9906 2218
Email: info@allenandunwin.com
Web: www.allenandunwin.com

National Library of Australia
Cataloguing-in-Publication entry:

Suzuki, David T., 1936-

Suzuki's green guide / David Suzuki.

978 1 74175 693 7 (pbk.)

Includes index.

Environmental protection--Citizen participation--Handbooks, manuals, etc.
Sustainable living--Handbooks, manuals, etc. Green products--Handbooks,
manuals, etc.

363.70525



The paper this book is printed on is certified by the Forest Stewardship Council (FSC) © 1996 FSC A.C. The FSC promotes environmentally responsible, socially beneficial and economically viable management of the world's forests.

Printed in Australia by Ligare Pty Ltd, Sydney

10 9 8 7 6 5 4 3 2 1

*This book is dedicated to every person
worried about the Earth
who has ever wondered “What can I do?”*

Contents

• • •

Acknowledgements *ix*

- 1 HELP WANTED: *Join the Sustainability Revolution* 1
 - 2 HOME SMART HOME 24
 - 3 FOOD FOR THOUGHT: *Eating a Planet-friendly Diet* 52
 - 4 TRAVELLING LIGHT 81
 - 5 LESS STUFF: *The Zero Waste Challenge* 106
 - 6 CITIZEN GREEN 128
 - 7 SMALLER FOOTPRINT, BIGGER SMILE 157
- APPENDIX: *Background on the Global Environmental Crisis* 168

Resources 178

Index 191

Acknowledgements



Thanks to all the good people at the David Suzuki Foundation and Greystone Books for supporting this book. In particular, we are grateful to Rob Sanders, Nancy Flight, Ann Rowan, Dominic Ali, and Barbara Tomlin. We would also like to thank all of the colleagues, friends, and family who reviewed parts of the manuscript and provided gentle but constructive criticism. And finally, a special thank you to Margot and Meredith for putting up with David B.'s obsession with reducing his family's ecological footprint during the months of research and writing for this book.



Help Wanted: Join the Sustainability Revolution

Imagination is more important than knowledge.

ALBERT EINSTEIN



“What can I do?” This is the question people inevitably ask when thinking about today’s environmental problems—the climate crisis, declining biological diversity, and toxic pollution. It’s a short and simple question, but there’s no easy answer (which is why we wrote this book). Everything we do has some kind of impact, but some decisions and actions are more important than others. Nearly all of us want to do the right thing when it comes to the environment, but few of us have the time or the specialised knowledge necessary to sift through the competing claims and mountains of information about the greenest choices. It can be confusing when we hear media reports suggesting:

- There’s still scientific debate about the cause of climate change (there’s not).
- It’s more eco-friendly to drive to the store than to walk (it’s not).
- It’s fine to buy a gas-guzzling Hummer rather than a hyper-efficient hybrid Toyota Prius (ridiculous).

This book cuts through the fog, identifying the most important actions we can take and how to get started. Knowledge plus motivation equals action.

THE ECOLOGICAL FOOTPRINT

For many of us, caught up in the trials and tribulations of day-to-day living, the state of the world's climate, oceans, forests, soils, rivers, wildlife, and wetlands may seem remote. Yet the basic biological reality is that humans are still utterly dependent on the natural world and its ecological processes for our health, well-being, and prosperity. All humans need to breathe, eat, and drink, and it's nature that provides us with fresh air, clean water, and the ability to grow food. All humans require a reasonably hospitable climate, and the interconnected web of natural systems regulates the planet's climate and makes life on earth viable.

A prime example of this dependence is our reliance on insects for pollination of food crops. Indigenous people relied exclusively on wild species for pollination. Today, however, honeybees originally taken from Europe to North America pollinate about one-third of the crops eaten by Americans. These crops, ranging from almonds and apples to soybeans and strawberries, have a value of \$15 billion annually. Various environmental problems, including the introduction of parasitic mites, caused a 50% decline in honeybee colonies between 1971 and 2006. Now the introduced honeybees are experiencing a sudden population crash labeled colony collapse disorder, causing additional losses of 30% to 70%. Although the cause of the problem is not known with certainty, various human disruptions are the prime suspects. Native North American bees are also experiencing extinctions, extirpations, and population declines. Decades ago Albert Einstein reportedly warned "If the bee disappears from the surface of the earth, man would have no more than four years to live. No more bees, no more pollination,

no more plants, no more animals, no more man.” Today there are still no technological alternatives to animal pollinators.

While our individual actions may seem insignificant when viewed in isolation, the cumulative impact of billions of apparently benign actions is devastating. Scientists at the University of British Columbia in Canada created a concept called the ecological footprint in an effort to illustrate the connections between individual actions and global consequences. The ecological footprint measures how big a chunk of the planet is needed to produce the resources for, and assimilate the waste of,

.....

≡ AN APPLE'S ECOLOGICAL FOOTPRINT ≡

CONSIDER two seemingly similar apples. One apple grew on a tree in your backyard using nothing but sunshine, compost, and rainfall, relying on natural processes to avoid diseases and pest infestations. When the apple was ripe you simply picked it and ate it (or made apple pie). The other apple grew on a commercial farm in another country. This apple was grown in soil that required chemical fertilisers and irrigation to nourish the tree. Pesticides made from fossil fuels were used to battle pests and diseases. Large machinery powered by dirty diesel fuel was used on the farm, along with migrant labour. The apple was waxed, packed in a box, and shipped thousands of kilometres to your country (using more energy and generating more emissions). Then it was trucked to a distribution centre and eventually to a store. All along the line, the apple was refrigerated to keep it fresh, using yet more energy. You drove to the store to purchase groceries and returned home, where you ate this second, noticeably less tasty apple. The local apple obviously requires far fewer resources to grow, harvest, transport, and store. By using less energy, it causes less pollution. In short, the local apple has a much smaller ecological footprint than the imported apple.

.....

one person for a year. Ecological footprints include the dimensions of land and water required to produce crops, livestock, fish, wood products, and energy, as well as the area required to absorb the carbon dioxide produced by burning fossil fuels. The size of our individual ecological footprint depends on where we live, what we eat, how we travel, and other ways that we use energy and consume resources. You can estimate your ecological footprint at www.myfootprint.org.

TABLE 1. *Average ecological footprints (hectares)*

United States	9.6
Canada	7.6
Australia	6.6
U.K.	5.6
Europe (EU-25)	4.8
Middle East and Central Asia	2.2
Latin America	2.0
China	1.6
Asia Pacific	1.3
Africa	1.1
GLOBAL AVERAGE	2.2

Globally, the average ecological footprint for all of humankind is 2.2 hectares (5.5 acres) per person, although there are wide variations between and within nations (see Table 1). This seemingly small number, 2.2 hectares, may not appear to be problematic (a hectare is a square area where each side of the square is approximately the length of a football field). However, Earth has a limited quantity of biologically productive areas—cropland, pasture, forest, lakes, rivers, wetlands, and oceans. Given the planet’s current population of 6.5 billion people, there are only 1.8 productive hectares per person

available globally. The ecological bottom line is that humanity's footprint exceeds Earth's capacity by about 25%. The planet's remarkable regenerative capacity can no longer keep up with our demands. People are turning resources into waste faster than nature can turn waste back into resources. We're no longer living off the annual interest provided by Earth's bounty but are running an ecological deficit and eroding the planet's natural capital.

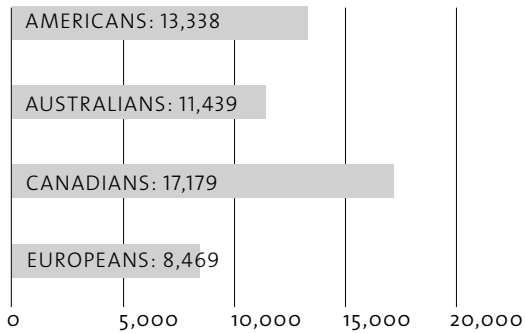
When we look at societies like ours, the problem becomes more severe. North Americans have the largest ecological footprints in the world. The average American footprint is 9.6 hectares, or about twenty football fields in size (second largest in the world behind the United Arab Emirates). The average Canadian footprint of 7.6 hectares is third largest in the world, and the Australian footprint of 6.6 hectares is sixth largest. If everyone living in the world today consumed resources and produced waste at the prolific rate of North Americans and Australians, then we'd need three or four additional planets like Earth.

The average ecological footprint for a Western European is 4.8 hectares, half the size of the American footprint despite similar levels of economic prosperity. Europeans offer the rest of the world many lessons in living sustainably, including their use of extensive public transportation systems, small vehicles, and compact cities; their efficient buildings, appliances, and heating systems; their tough rules for toxic chemicals; and their strong efforts to reduce air and water pollution. But even the ecological footprints of Europeans are unsustainable and lead to significant environmental impacts (see Figures).

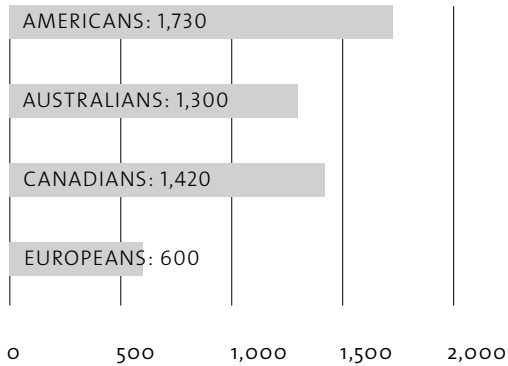
Despite the emergence of environmentalism as a powerful social movement, the sheer number of humans and our collective appetite for resources mean that our ecological impacts in the decades ahead could become even larger. Economic growth and an increasing human population could worsen the world's

COMPARISON OF ANNUAL ENVIRONMENTAL IMPACTS

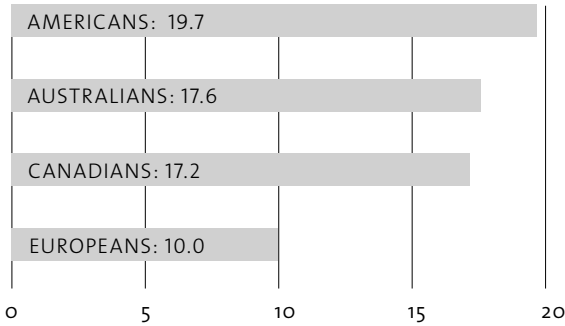
Average electricity use per capita (kilowatt hours)



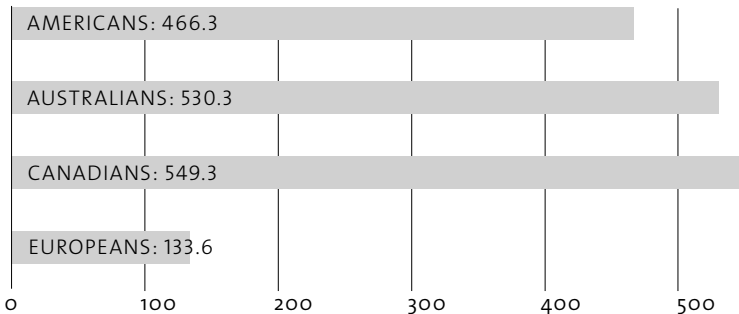
Average water use per capita (cubic metres)



*Average amount of carbon dioxide generated
by energy use per capita (metric tons)*



*Average volume of air pollution
(sulfur dioxides, nitrogen oxides, volatile organic carbons,
and carbon monoxide) generated per capita (kilograms)*



environmental problems. From this perspective, it's obvious that something must be done to reduce the ecological footprint of people living in wealthy industrialised nations. A reduction of North Americans' ecological footprint by at least 75% to less than 2 hectares per person is needed to achieve a sustainable future. This is similar to the levels of greenhouse gas reductions (60% to 80%) that scientists indicate are necessary by mid-century to avoid triggering catastrophic climate change.

IMAGINING A SUSTAINABLE FUTURE

This is a defining moment in human history. With the possible exception of nuclear war, there has never been a greater threat to future generations than today's global environmental crisis. Paradoxically, there has never been a greater opportunity for profound change.

Human beings are remarkable animals. The quality that sets us apart from the vast majority of other species on Earth is our ability to think ahead, contemplate the consequences of different options, plot a course, and act accordingly. We only have to think back to 1957, when the world was electrified by the announcement that the Soviet Union had successfully launched Sputnik, the first manmade object to be hurled into space. The U.S. was galvanised to launch its own satellites, but every attempt failed in spectacular explosions on the launch pad or shortly after lift-off. The Soviets launched the first animal, a dog named Laika, the first human, Yuri Gagarin, the first team of cosmonauts, and the first woman, Valentina Tereshkova, while the U.S. struggled to get its space program up and running. No voices were raised to say America couldn't afford to compete with the U.S.S.R. or that it would destroy the economy. The North American Space Agency (NASA) was formed. Recognising that the Soviets were advanced in mathematics, science, engineering, and medicine, the U.S. spent massive amounts of money to support science.

President John F. Kennedy made his famous assertion that the U.S. would win the race to the moon. Not only were the Americans the first country to land people on the moon, but in 2006, almost fifty years after Sputnik, Americans won every Nobel Prize in science because the U.S. took up the challenge and threw everything behind it. Today we face ecological challenges far more daunting than the space race or the cold war. We need to allocate the effort and resources for a suitably ambitious response.

By using our unique foresight, we can envision a different future, a sustainable future. After a destructive period of human arrogance, we are on the brink of an environmental revolution inspired by the wisdom and genius of nature. By patterning our economy after the natural world, which has had almost 4 billion years to work out the wrinkles, we can achieve a sustainable society that can endure and flourish for countless generations to come. In the natural world, nothing is wasted. Zero waste needs to become the basis of the human economy as well as nature's economy. The success or failure of the twenty-first century's sustainability revolution will determine the future of humankind and many species on Earth.

This is a time of transition between the industrial era and the sustainability era. We are slowly replacing an economy that ignores ecological limits with an economy that respects ecological limits. We are near the end of an era known for profligate consumption of dirty energy and at the beginning of an era where conservation, efficiency, and clean energy will predominate. Within one or two generations, humanity will rely primarily on energy that releases few or no climate-changing carbon emissions. We are moving away from being a society that recklessly uses toxic chemicals without adequate knowledge about their impacts on human health and the environment. With human ingenuity and nature's inspiration we can redesign

everything we make to virtually eliminate the production and use of toxic substances. We are shifting away from being a society that consumes resources at one end and spews out waste at the other. We are becoming a society where the very idea of waste is anathema. We are evolving into a society where words like disposable, garbage, gas guzzler, and factory farm will soon be seen as anachronisms, if not obscenities. We are on our way to becoming a society that looks back on the twentieth century's excesses as a form of temporary insanity.

People's values are evolving rapidly. Five decades ago the environmental movement, as we know it, didn't exist. There was no Greenpeace, no World Wildlife Fund. Not a single country in the world had a ministry of the environment. Today, tens of millions of people belong to environmental organisations. Every government in the world has an environment department. In recent years, over seventy nations, from France to Finland and Argentina to Zambia, have amended their constitutions to recognise that all people have the right to live in a healthy and ecologically balanced environment. Constitutions in many nations now place the right to a healthy environment on par with other fundamental human rights. More than just words on paper, constitutional environmental rights will continue to have a profound influence on educating the public, tipping the balance in favour of the environment in policy decisions, and ensuring that disadvantaged groups enjoy environmental justice. Constitutional environmental rights have been central in securing clean drinking water for communities in Argentina, cleaner air in the large cities of India, and protection of biodiversity in Finland and Costa Rica.

A sustainable future lies within the reach of our imaginations. Imagine a vehicle whose only waste product is water (we're not referring to a bicycle and your sweat). Imagine getting a cheque from your electricity company every month instead

of a bill, because your home generates more electricity than it consumes. Imagine fresh, delicious, and nutritious food grown locally without pesticides, antibiotics, genetically modified organisms, or growth hormones. Imagine an agricultural system where trees, perennial grasses, cattle, chickens, and hogs are raised in sustainable, humane ways with few resources from off the farm and no waste. Imagine a city without noise and pollution from the infernal internal combustion engine. Imagine never having to worry that invisible environmental hazards are undermining your health and your children's health. Imagine industrialised nations that consume no fossil fuels, relying instead on solar energy, geothermal energy, and other sources of clean energy. Imagine that every product you buy is free from toxic chemicals, and that when things eventually wear out or break down, their manufacturer is responsible for taking care of them. Imagine that everything you ever buy is biodegradable, reusable, or recyclable.

Does this description of the future sound like a dream, or a science fiction version of ecological utopia? Perhaps, but it's not. These developments are much closer to becoming reality than many people realise, as the following examples illustrate.

THE END OF THE FOSSIL FUEL ERA

Every plant on the planet derives its energy from the sun, through the process of photosynthesis. More solar energy reaches the Earth in one hour than all humans use in one year. Yet despite its immense potential, solar power is only beginning to be harnessed on a large scale for electricity generation. The largest solar photovoltaic power plant in the world is a 40-megawatt plant in Germany, the result of rapid developments since 2004—when the largest plant could generate only 6 megawatts of electricity. The growth of large solar thermal power plants—which use mirrors and lenses to concentrate the

heat of the sun to extremely high temperatures—promises to be even more dramatic. While the largest single solar thermal plant in the world today is an 80-megawatt plant, much larger solar thermal facilities are being planned or constructed in California, Florida, Egypt, and South Africa. A major American utility company, Pacific Gas and Electric, recently signed a contract to buy 553 megawatts of solar power from a solar thermal facility being built in the Mojave Desert. Covering 23 square kilometres (9 square miles), the solar power plant will provide enough power for four hundred thousand homes in California, making it the largest solar power plant in the world. An even more ambitious solar thermal project is being discussed for the Sahara Desert, which could potentially provide all of the electricity needed by Europe, the Middle East, and North Africa while covering less than 0.5% of the desert.

Researchers at the University of New South Wales in Australia have made a series of breakthroughs in solar technology. They are using special titanium oxide ceramics to harvest sunlight and split water, producing hydrogen fuel. Rooftop panels placed on several million houses could meet Australia's entire electricity needs. Solar cells on metal sheets thinner than paper represent another exciting technological breakthrough. These thin-film solar cells, named 2007's innovation of the year by *Popular Science*, could be used to coat everything from buildings to cell phones, creating unprecedented energy independence. An American company called Nanosolar is already manufacturing and selling thin-film solar cells.

Inspiration

Sweden is pursuing a comprehensive strategy to eliminate the nation's dependence on oil by 2020. Swedish reliance on oil already dropped from 77% to 32% of total energy consumption between 1973 and 2003. The new strategy, developed by a

blue-ribbon Commission on Oil Independence, includes switching vehicles to biofuels; ending the practice of heating residential and commercial buildings with oil; accelerating development of renewable energy; district heating (using co-generation and waste heat to meet domestic needs); taxes on nonrenewable energy sources, carbon emissions, and vehicle use; and grants to municipalities to invest in sustainable projects. As the Commission concluded, “We are technology optimists and want Sweden to be at the forefront in the use of new, resource-efficient, renewable technology—hybrid vehicles, solar cells, wave energy, fuel cell vehicles, new biofuels, and energy-saving IT solutions.” The goal of oil independence is part of a remarkable Swedish strategy to solve all of the country’s environmental problems over the course of the next generation.

Iceland aims to be the world’s first hydrogen economy by 2050, using its hydroelectric and geothermal energy resources to produce hydrogen. The primary advantage of using hydrogen as a fuel is that it produces no polluting by-products at all, only clean water. Hydrogen fuel cell buses already run on the streets of Reykjavik, Iceland’s capital. The world’s first commercial hydrogen filling station opened on a busy downtown street in 2003. The government’s goal is to convert all of Iceland’s motor vehicles and the fishing fleet to hydrogen in the decades ahead.

An island called Samsø off the coast of Denmark is earning global acclaim for rapidly converting from fossil fuel dependency to renewable energy. Since 1997 Samsø has commissioned an offshore wind farm that produces more electricity than the island (with a population of about 4,300) consumes, has built several district heating systems that rely on solar power, straw, and wood chips to heat houses, and plans to grow canola to provide biodiesel for vehicles. In less than a decade, Samsø has gone from relying on fossil fuels for 92% of its electricity and

85% of its heat to producing 100% renewable energy for both electricity and heat.

Zero Energy Buildings

Zero energy buildings are energy-efficient buildings that rely on renewable energy, usually generated by solar panels, to produce as much energy as they consume over the course of a year. These buildings can be ordinary looking (except for the solar panels on the roof), offer healthy indoor environments, and require minimal maintenance. Zero energy buildings are already being built in the U.S., Canada, Australia, the U.K., Sweden, Germany, Portugal, and Austria. The British government recently unveiled a proposal to ensure that *all* new houses be zero energy, beginning in 2016. Ambitious architects and engineers are going even further and creating energy-plus buildings—buildings that produce more energy than they consume—in locations ranging from Austria to Thailand. An entire community of energy-plus buildings is already up and running in Freiburg, Germany, where homes are generating two or three times the amount of electricity they consume in a year.

Several sustainable villages have been built in Australia, ranging from the Curumbin Ecovillage in Queensland to the townhouses at Christie's Walk, Adelaide. A new subdivision in New South Wales near Port Macquarie, the Camden Haven Ecovillage, has been exempted from paying developer taxes because it has been designed to cut climate change pollution by 48% compared to a typical subdivision. It will grow on site over 25% of the food needed by the 200 residents and summer temperatures will be reduced by 6 to 8 degrees with light roofs, pale road tar and interlocking tree canopy over the roads. All water will be rainwater and recycled, sterilised sewage will be used to flush toilets, wash clothes and

irrigate. Instead of timber fences, productive grapevines and fruiting plants will define property boundaries.

There are already hundreds of zero energy homes in the U.S., in locations as diverse as Chicago, Illinois, Boulder, Colorado, and Salem, Oregon. The largest zero energy housing development in the U.S. is in Watsonville, California. The project includes 177 single-family homes, 80 townhomes, 132 apartments, a park, and an elementary school. Buildings feature solar panels to generate electricity, instant solar water heaters, increased insulation, reflective roofs, tightly sealed ducts, energy-efficient appliances and windows, compact fluorescent lights, and water-saving plumbing fixtures and landscaping.

The Drake Landing Solar Community in Okotoks, Canada, is the first housing development in North America to use district heating powered by the sun. Solar panels capture the sun's heat and store it underground to provide heat in the winter. The result will be a reduction of at least 80% in greenhouse gas emissions from this community.

The Mata de Sesimbra project being built in Portugal includes zero energy buildings, a large nature reserve, restoration of a large cork forest, a twenty-year zero waste plan, 100% renewable energy, and a pledge to get 50% of food in onsite stores and restaurants from local growers and producers.

In Australia and New Zealand over 100 sustainable houses around the two countries are open to the public one weekend each year for Sustainable House Day. The house owners are generally available to pass on their tips and advice, and to chat about anything from builders and architects to suppliers, from what not to do to lessons learnt (www.sustainablehouseday.com).

Zero Emission Vehicles

Zero emission vehicles are already being manufactured, albeit in small quantities and at high prices. Prototype hydrogen fuel

cell vehicles are already operating on city streets in Vancouver, Chicago, and many European cities. Quantum Technologies is already delivering hydrogen fuelled Toyota Priuses to Norway. Fully electric vehicles with limited range and speed—from companies including Xebra, ZENN, and Miles Automotive—are already available at car dealers. Increasingly sophisticated zero emission electric vehicles such as the Aptera are generating buzz at auto shows around the world. For example, the Tesla Roadster is a fully electric vehicle that can go from 0 to 100 kilometres (60 miles) per hour in four seconds, has a range of 390 kilometres (245 miles), and is expected to go into production in 2008. Phoenix Motorcars is selling full-function electric pickup trucks that can travel more than 160 kilometres (100 miles) on a charge.

Zero Waste

Zero waste is catching on as a goal for individuals, corporations, and municipal governments. Zero waste means redesigning patterns of production and consumption to ensure that everything used or produced is reusable, recyclable, or safely biodegradable. The benefits of zero waste include job creation and economic development, reduced waste disposal costs, and reduced greenhouse gas emissions. In New Zealand, nearly three-quarters of local governments have passed resolutions setting zero waste as a goal, and some areas have already reduced the amount of waste going to landfills by up to 90%. New Zealand was the first country in the world to recognise that women have the right to vote, the first country to have a national nuclear-free policy, and is striving to become the first waste-free country.

Sustainable Agriculture

Sustainable agriculture is making a comeback. Sales of local and organic food are skyrocketing. Farmers and scientists in

the U.S. are reimagining the production of food, using natural models for inspiration. Wes Jackson and the Land Institute are striving to emulate native prairies, enabling farmers to harvest a diversity of grain crops without annual plantings. This visionary approach aims to improve the security of food systems by decreasing dependency upon fossil fuels, reducing soil erosion, and alleviating the chemical contamination of land and water by pesticides. As Jackson writes, “The wild prairie, unlike current agriculture, holds soil, provides its own fertility, runs on sunlight, efficiently manages rainfall, and is not plagued by weeds or epidemics of pests or diseases. We can fashion an agriculture with the same benefits.” Many farmers, including Joel Salatin and his Polyface Farm, are recreating the natural cycle whereby the land nourishes animals, and animals nourish the land.

Sustainable Products

Makers of seemingly mundane products—including underwear, carpets, shoes, and office furniture—are applying a radical new design philosophy called the cradle-to-cradle approach. Developed by chemist Michael Braungart and architect William McDonough, the concept is breathtakingly simple. Everything we make and use must be capable of entering one of two streams at the end of its useful life: the biological stream or the technological stream. The biological stream involves returning biodegradable materials to the land, enriching the soil so that we can grow more food, forests, fibres, and flowers. The technological stream requires materials to be endlessly cycled, manufactured over and over again. In McDonough’s words, “The materials go back to soils safely, or they go back to industry. That’s it. That’s the new paradigm.” The cradle-to-cradle approach is making the leap from vision to reality. McDonough and Braungart have awarded cradle-to-cradle

certification for meeting their rigorous sustainability criteria to dozens of innovative products, including fabrics, all-purpose cleaners, nappies, building exteriors, wall coverings, and surfboard wax.

Interface Carpets, a U.S. company led by sustainability champion Ray Anderson, is a major manufacturer that employs the cradle-to-cradle approach. Interface's ambitious goal, Mission Zero, is to eliminate the company's negative impacts on the environment by 2020. Interface invented a glueless installation process (no more toxic volatile organic compounds), designed a line of completely biodegradable carpets, eliminated the use of heavy metals, and recycled over 45 million kilograms (100 million pounds) of carpet that would otherwise have ended up in landfill sites. Over the course of a decade, waste is down 70%, energy use down 50%, greenhouse gas emissions down 60%, and water use down 80%. In addition to these environmental benefits, Interface saved over \$300 million, enjoyed record sales levels, and saw share prices soar. Shaw Industries, another large carpet manufacturer, also offers carpets that can be recycled over and over into new carpet, not recycled into inferior products or dumped in landfills. Shaw's sustainable carpet also cut manufacturing costs by more than 10%.

Steelcase and Herman Miller, large office equipment manufacturers, are committed to refurbishing or recycling all office products that they manufacture and have developed a line of upholstery fabrics that, unlike conventional fabrics containing toxic substances, are safely biodegradable.

Patagonia, a leading maker of outdoor clothing, operates the Common Threads Garment Recycling Program, which encourages customers to return their worn-out clothing—polyester fleece, organic cotton t-shirts, and polyester underwear—to the company. The used clothing is used to remanufacture new garments. The program reduces waste by diverting used

clothing from landfills, reduces energy use by 76%, and cuts greenhouse gas emissions by 71%. Canada's Mountain Equipment Co-op recently started a similar program.

Even Nike, once reviled by activists, has adopted the principles of cradle-to-cradle design. Nike's environmental policy strives for zero toxics, zero waste, and 100% recovery, recycling, and reuse of the products they manufacture. Nike recently released a basketball shoe called TrashTalk made entirely from scrap materials and is designing a running shoe with a biodegradable sole and an upper portion that can be endlessly remanufactured into new shoes.

The resource savings, elimination of waste, and reduced environmental pressure embodied in the cradle-to-cradle approach are essential to the future of humankind when you envision a future of 9 billion people seeking a high standard of living.

WHAT CAN YOU DO?

The seeds of a sustainable future are germinating but need to be carefully nurtured. Unfortunately, we don't yet live in a world where all of our options are sustainable choices. Coal and gas-fired power plants still dwarf solar power, wind power, and other zero emission sources of electricity. Only a handful of zero energy housing developments exist. We can't yet visit a local car dealer and choose between electric cars and hydrogen fuel cell vehicles. Local and organically grown foods make up a minority of overall food consumption. Toxic chemicals are still used in myriad consumer products, while cradle-to-cradle products constitute a tiny fraction of industrial output.

We can't afford to wait for future technological advances to save the biosphere. Although our individual actions may seem trivial, they are not. The effect of one person bringing his or her own bag to the supermarket may seem inconsequential in the

global context, a tiny drop in the bucket. But if we all brought our own bags, the total impact would be enormous, in the same way that enough drops can fill a bucket. The same logic applies to actions like switching to compact fluorescent light bulbs. When one person or a few dedicated environmentalists do it, the effects are negligible. But when an entire community, state, or nation makes the switch, as Canada and Australia are proposing, the impact can be enormous. Planned coal-fired generating plants can be taken off the drawing board. Nuclear plants can be mothballed. Until the sustainability revolution arrives in full force, we need to buy some time for the beleaguered planet. That's why we need to do everything we can to reduce our ecological footprints today. No one sets out to deliberately ruin the planet, but to varying degrees we are all part of the problem. In so many ways, through ignorance, laziness, or indifference, our actions add up to a destructive effect. Once we become aware of the impact humanity is having, the challenge is to deliberately change deeply engrained habits.

This book identifies the individual actions that cause the most environmental damage and describes the most effective ways to reduce your impact. The three areas of individual or family action that have the greatest environmental impacts are related to household activities (heating, cooling, appliance use, lighting, etc.), food, and transport. Together these three areas represent roughly 80% of the average North American's contribution to climate change, air pollution, water pollution, and the loss of biodiversity.

Chapters 2, 3, and 4 are dedicated to exploring green choices in each of these areas:

- The homes where we live.
- The food we eat.
- The way we travel.

Chapter 5 describes how to make greener choices for all of the other stuff we buy. And while actions by committed individuals can put a dent in the global environmental crisis, they cannot solve it, so Chapter 6 identifies how you can exercise your democratic powers to promote policies that ensure everyone—citizens, politicians, bureaucrats, and business people—behaves in a sustainable way. Laws, taxes, subsidies, and policies of all kinds need to be transformed in order to accelerate the sustainability revolution. As Al Gore says, “changing light bulbs is useful, but it’s more important to change laws.” Economic policies need to be rewritten to incorporate ecological reality. Subsidies that encourage environmentally destructive behaviour need to be terminated. Taxes need to be shifted away from activities that society wants to encourage, like employment and investment, onto activities that society seeks to discourage, like waste, pollution, and the use of toxic chemicals. Governments need to measure progress more holistically, rediscover the effectiveness of strong environmental regulations, and allocate far more resources to promoting environmental solutions. None of these policy changes is likely to be implemented without sustained pressure from concerned citizens.

By following the advice in this book, you won’t suffer a loss in the quality of your life but you will:

- Generate fewer climate-changing greenhouse gas emissions.
- Produce less water pollution.
- Cause less air pollution.
- Discard less waste.
- Use up fewer natural resources.
- Reduce your exposure to toxic chemicals.
- Relieve pressure on endangered species and their habitat.

Following our recommendations will enable you to reduce your ecological footprint to half or even as little as one-tenth

of its current size. This may sound impossible but consider the dramatic effects of these everyday examples of technological and behavioural change:

- Today's most energy-efficient refrigerators use less than one-quarter of the energy of refrigerators made a generation ago (and no longer use the chemicals that were destroying Earth's irreplaceable ozone layer).
- Recycled aluminum cans use just 5% of the energy required to make aluminum cans from virgin materials.
- A laptop computer uses as little as one-tenth the energy that a desktop computer uses.
- Printing on both sides of paper reduces paper consumption by 50%.

Kermit the frog was wrong when he said "it ain't easy being green." The actions outlined in this book don't require sacrifices. You don't have to switch to a raw food diet, or trade in your comfortable home for a tent or a cave. We're not physically addicted to stuff. There are no painful withdrawal symptoms when we change our consumption habits. To the contrary, in addition to reducing your contribution to global environmental problems, you'll also:

- Improve your health.
- Save money.
- Feel less guilty and less helpless.
- Enhance your quality of life.

Perhaps most importantly, reducing your ecological footprint is likely to make you happier. Materialistic values actually undermine our well-being by perpetuating feelings of insecurity and by weakening the ties that bind us to families, friends, and communities. Individuals with materialistic values are more likely to suffer anxiety and depression, watch more tele-

vision, abuse alcohol and drugs, and have unsatisfying personal relationships. In contrast, people who ride bicycles, recycle, and appreciate nature tend to be happier, healthier, and more fulfilled.

There are millions of people doing their best to achieve a sustainable, just, and prosperous future. Every reduction in the size of your ecological footprint takes a little bit of pressure off the planet. We are in trouble. The planet is warning us that we must change course, and there's no time to waste. Join the sustainability revolution!