

## PREFACE

**T**he field of sustainability is rapidly evolving. We decided to update this book because we increasingly believe that cities hold the key to achieving sustainability. In this second edition, we have incorporated our recent research on sustainable finance and sustainability measurement. To ensure that this book has a planet-wide reach, we added the contributions of an author who has a global perspective. Much of our recent research on sustainable cities has focused on low-income countries where sustainability awareness is lower than in high-income countries, even though the need for sustainability is arguably greater in the former. For that reason, we expanded our analysis to include a broader perspective on building sustainable cities, and not just as a way to live in harmony with nature but also as a sustainable engine for economic and social development. Urbanization is going to continue, especially in middle- and low-income countries. However, in the past few years, we have observed alarming trends toward greater urban inequality and increasingly nationalistic politics. We examine these trends in this second edition and discuss whether urban sustainability can serve as a new model of inclusive and environmentally sound growth.

Why did we write a book on sustainable cities in the first place? A great paradox of the transition to a sustainable economy is that it will not be achieved in rural places in harmony with nature but rather in cities built to exploit nature without destroying it. Cities are the structure that evolved over time to deal with the constant tension between serving the needs of an ever-growing population and depleting the world's finite resources. It is in cities that innovation and technological breakthroughs

have kept pace with population growth, which ensured not only that we did not starve to death but also a growing proportion of people—living in cities—would thrive. On the other hand, cities are also where many of our crisis originate, such as the climate change and the COVID-19 pandemic. This book focuses on cities because place matters. Economic, technological, and cultural forces are moving people out of rural areas and into urban areas. The urban migration now under way is a worldwide phenomenon that reached a critical inflection point in 2007, when for the first time, most of the people on the planet lived in cities.

To be sustainable in a brain-based economy, cities need to follow sustainable practices and secure buy-in from the public, the government, and the private sector. Everyone needs to invest time, energy, and money to create the sustainable city. The infrastructure to support the generation and transmission of renewable energy; develop mass and personal transit; and treat and transform water, sewage, and solid waste can be built and even managed by private contractors. It still requires, however, a public sector that is active, ethical, sophisticated, and able to form productive public-private partnerships. Environmentally conscious consumers are driving many of these initiatives by companies and government through their lifestyle changes in consumption and in work.

Although the global economy leads to a homogenization of fashion, entertainment, and aspects of culture and professional life, the human need for a sense of place and distinctiveness is countering some of these trends. In the process of becoming more sustainable, cities also have to find their distinctive identity, based on distinct characteristics of people, industry, policies, geography, and culture. Many cities are already making progress by investing in different parts of the infrastructure of the future, but the sustainable city still has a long way to go.

This second edition of *The Sustainable City* provides a broad overview of the sustainable city from a variety of levels of analysis and perspectives: individual, organization, financial, measurement, community, government, and global. We not only need to activate the citizens, the private sector, and the government, but also need considerable financing and to change the way we measure and evaluate success. This edition expands on the thesis of a multistakeholder approach to urban sustainability and dives deeper into the financing of the type of changes needed in all of

the aspects of urban sustainability we define in the book, and the much-needed efforts to measure sustainability progress in a way that eschews the single-bottom-line paradigm.

The second edition updates many of the examples and case studies from initiatives, projects, policies, and legislation we had discussed in the first edition and adds many more. It also examines past and potential future trends, contains real solutions and applications, and looks at the key aspects of a sustainable urban lifestyle. The book has three parts: part I, Concept; part II, Case Studies; and part III, Conclusions.

The book begins in chapter 1 by defining the sustainable city. The overall definition of such a city is one that facilitates human economic (production and consumption) and social life with the least possible impact on the natural environment. This means that material flows into and out of the city are thought through and managed to minimize the destruction of natural systems. What are the elements of a sustainable city? The city's water supply comes from sources that are replenished through natural processes or from sources that can be withdrawn without damaging ecosystems. The city's solid waste is recycled as much as possible with food waste converted to fertilizer and other materials separated for reuse as well. Other systems such as sewage treatment, storm water drainage, energy, food, health care, and transportation are designed for efficiency and for the least possible environmental impact. We add in the second edition a brief history of cities, explain how they evolved to the present day, and expand on the rationale explaining why a book on sustainability should focus on cities. Chapter 1 also provides an overview of what is needed from the key stakeholders of government, the private sector, and the public to make the transition to urban sustainability. The ensuing chapters expand on each of these areas.

Chapter 2 defines and explains sustainable urban systems and what "sustainability" means in each of these systems, including energy, water, waste, sewage, food, transport, and public space. We add in the second edition another critical part of the physical dimension of urban sustainability—that is, the urban health system. We learned about the central role of health care in the sustainable city during the COVID-19 pandemic, and how a widespread failure of urban health systems and a singular focus on economic growth can wreak havoc globally.



This chapter defines and assesses the technical, financial, organizational, and political requirements of the sustainable city.

Chapter 3 is about citizen engagement and discusses the sustainable urban lifestyle. Our effort is to distinguish the way people live in a sustainable city from that of people who attempt to live close to nature in rural areas. Obviously, urbanites pursuing a sustainable lifestyle are not living off the grid, growing all their food, and disposing their food waste in a compost heap. They may well, however, grow some food in a neighborhood garden, participate in a farm-share in which they guarantee they will purchase the produce of a local farmer, use renewable energy, practice energy efficiency, and send their food waste to an anaerobic digester.

The sustainable city involves a sustainable lifestyle and a transformation from the consumer society to something else. The twenty-first-century brain-based economy has changed the nature of production and consumption. Rather than being defined by the size of one's home and the consumer items one possesses, the sustainable lifestyle involves a search for different values. Consumer items remain valued, but they become means rather than ends. Consumption becomes more oriented toward services, entertainment, travel, and experiences and less oriented toward possessing manufactured products. Such products become commodities in the sustainable city, providing the necessities of life, but no longer serving as self-justifying goals. Culture and values are far more powerful forces of social change and consumption patterns than regulation.

This chapter defines and explains the sustainable urban lifestyle that can be achieved in the sustainable city. It includes a discussion of the changing nature of consumption and the changing nature of work. The chapter also discusses the driving role played by the younger generation in the urban sustainability transition and explains the importance of lifelong learning in adapting to fast-changing circumstances, which is becoming the norm in the brain-based economy. The second edition complements the discussion on reurbanization in the United States by including a section on urbanization from the perspective of middle- and low-income countries, where the need for their cities to be sustainable could be even greater, particularly given their large population.

Chapter 4 delves into organizational innovation and the change required to make sustainability real. We leave sociology behind to focus

on organizational management and the movement toward an organizational focus on the physical and social dimensions of sustainability. Today's corporations, nonprofits, and governments are operating on a more crowded and interconnected planet that provides great opportunities but also poses great threats. Arguably organizations are responding to greater population, consumption, resource scarcity, environmental degradation, and increased risk and liability and are factoring these issues into routine decision making. Energy, water, and other raw materials are becoming a larger element of the cost structure of all organizations. Organizations are routinely looking at energy consumption as a way to cut costs and increase efficiency. Global competition means that someone someplace is doing the same thing you are, and if you don't keep improving, they could knock you out of business.

Similar trends can be seen as organizations assess their use of water and other material resources. The costs and impact of waste, discharges of effluents, and emissions are now subject to critical analysis. This is not only for regulatory compliance: in some organizations, the risk of environmental effects and the cost of insuring those risks have become part of routine decision making. In addition, organizations cannot simply implement sustainability initiatives within their walls; these initiatives must extend down the supply chain, which is increasingly global. Although the COVID-19 pandemic may have interrupted the process of globalization, the interconnectedness of the global economy will continue to grow in the long run, especially as we face down the challenge of climate change. Sustainability-minded managers are learning that the environmental and social performances of their supply chains can quickly be reflected on their financial bottom lines.

Chapter 4 discusses these issues and outlines the approaches organizations have been adopting to implement sustainability as a basic tool of management. This chapter also provides examples of organizations that ignored sustainability and had to pay a huge price for the consequence. Because of the difficulties quantifying social and environmental impacts, the state of sustainability measurement remains primitive. We expand from the discussion on metrics in the first edition by reviewing the various frameworks that companies and governments used to measure and report sustainability activities, and we discuss the public's role

in advancing and supporting sustainability metrics, measurement, and reporting. We then look specifically at the frameworks and indices that seek to measure and report urban sustainability around the world, which also is based on our research in this field.

In chapter 5, the book turns to a discussion of the role of politics and public policy in building sustainable cities. We needed public-private partnerships to build the industrial city of the nineteenth and twentieth centuries. Government and private corporations worked together to attract the capital and expertise required to build the energy, water, sewage, transport, and other infrastructure needed to ensure that people and businesses could live in thriving but dense modern settlements. We once again require such partnerships to build the sustainable city of the twenty-first century. While in the United States we desperately need federal sustainability policy, in the final analysis the environmental quality that people experience in their home communities will have the highest degree of political salience. A successful strategy to protect our environment will need to focus on local effects.

In addition to addressing the role of sustainability in local and state politics in the United States, chapter 5 in this second edition also examines how international politics and climate politics in particular are shaping the urban sustainability agenda around the world. The focus of this chapter is to examine sustainability politics at the local level and detail the force of these issues today and their potential in the future. Some issues are inherently local such that they require action at the city level. This chapter seeks to identify the sustainability issues that are typically subject to local discretion. Specifically, this chapter also addresses the following issues: the role of local government in the sustainability transition; public-private partnership in advancing sustainability initiatives; public opinion and values related to sustainability; mobilizing voters and building consensus; sustainability and partisan politics; and the challenge and opportunity of the NIMBY ("not in my backyard") syndrome.

Trillions of dollars are needed to finance the transition to sustainability, and therefore much of it depends on government leadership. Chapter 5 adds a discussion on public finance and other policies to attract capital to the sustainable elements of the economy. Specifically, government needs



to fund basic research, provide financial support to early stage innovation, and formulate policies that encourage private green investment.

As our economy has grown, we have noticed that in many cities, regardless of development level, income inequality has grown. Cities have the advantage of density, which is crucial to powering a brain-based economy and achieving sustainability. We also have seen in the world's cities, however, that economic segregation and spatial inequality grew to alarming levels, which, if left unchecked, could lead to social unrest that will impede innovation and economic growth. In a new chapter, chapter 6, we review the current trends in urban inequality and discuss the possible role of automation in exacerbating inequality. We also suggest some possible solutions to this emerging dilemma. We discuss whether a model of sustainability can successfully integrate economic and environmental goals and bring environmental and business interests together to power the next stage of economic and social development. We introduce a multidimensional approach to development and a multistakeholder approach in decision making and assess its compatibility with the paradigm of sustainability and social inclusion. Finally, as indicated earlier, sustainable urban development also needs finance. In addition to public financing for sustainable technology and urban infrastructure, financial markets now need to channel savings away from unsustainable production processes and shift investment that not only can deliver sustained economic return but also generate long-term environmental and social impact. Therefore, chapter 6 also discusses the development of sustainable finance for urban sustainability.

After defining and analyzing the concept of the sustainable city, part II then illustrates the concepts we introduced with a series of case studies. The goal of the case studies is to provide detailed examples of urban sustainability programs, policies, and projects that are in place and can be assessed. The concepts delineated and the issues raised in part I are illuminated and brought to life by these cases. The cases provide concrete examples of the actions needed to transition to sustainable cities.

Chapters 7 through 11 include the following case studies:

- Waste management: practices in New York City, Hong Kong, and Beijing
- Transportation: Bus rapid transit in Bogotá, light rail in Jerusalem, high-speed rail in China

- Energy infrastructure: Microgrids and smart grids in New York, Japan, and Africa, and ultra-high-voltage transmission system in China
- Public space: Gas Works Park in Seattle, Washington; the High Line Park in New York City; Victor Civita Plaza in São Paulo, Brazil; and Canal Park in Washington, DC
- Sustainable urban living and the sharing economy: Uber and Airbnb

The second edition updates all of the case studies with up-to-date information and recent developments. The new edition adds a case about the use of ultra-high-voltage lines to transmit renewable power over long distances to contrast with distributed generation, such as the use of microgrids.

Part III concludes with a summary of the policy, management, and political lessons learned throughout the book. The book's conclusion also frankly discusses uncertainties and issues that require additional research. We are confident that the transition to a sustainable and renewable economy will take place in the world's cities, but we are far from confident that we understand how that change will take place. For one, it is obvious that sustainability needs a concerted effort from a multitude of stakeholders, not least from all sovereign nations. Climate change and pollution ignore national borders, and no city can achieve sustainability alone given our globalized supply chain and other interconnectedness forged over decades. At a time when international collaboration is most needed to fight a devastating pandemic caused by a previously unknown coronavirus, cities and countries closed their borders. Lack of trust and cooperation have been fueling calls for self-sufficiency and a renationalization of the supply chain. We worry that the lessons from the pandemic rather than providing a call for greater cooperation and a common purpose for humankind will usher in a new age of nationalist politics and reverse (even just for a time) the engine of globalization and international cooperation. That would be detrimental to our pursuit of sustainability and to the fight against climate change. We want to be optimistic that the advantages of the global economy can overcome the power of xenophobia. Our hope is that this volume provides the basis for further discussion, research, and analysis of the transition to sustainable cities.