JERRY YUDELSON | ULF MEYER

THE WORLD'S GREENEST BUILDINGS

PROMISE VERSUS PERFORMANCE IN SUSTAINABLE DESIGN

Foreword by Professor Alison G. Kwok

ROUTLEDGE

The World's Greenest Buildings

Promise versus performance in sustainable design

Jerry Yudelson and Ulf Meyer

FOREWORD
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The World's Greenest Buildings

The World's Greenest Buildings tackles an audacious task. Among the thousands of green buildings out there, which are the best, and how do we know?

Authors Jerry Yudelson and Ulf Meyer examined hundreds of the highest-rated large green buildings from around the world and asked their owners to supply one simple thing: actual performance data, to demonstrate their claims to sustainable operations.

This pivotal book presents:

- an overview of the rating systems and shows "best in class" building performance in North America, Europe, the Middle East, India, China, Australia and the Asia-Pacific region
- practical examples of best practices for greening both new and existing buildings
- a practical reference for how green buildings actually perform at the highest level, one that takes you step-by-step through many different design solutions
- a wealth of exemplary case studies of successful green building projects using actual performance data from which to learn
- interviews with architects, engineers, building owners and developers and industry experts, to provide added insight into the greening process.

This guide uncovers some of the pitfalls that lie ahead for sustainable design, and points the way toward much faster progress in the decade ahead.

Jerry Yudelson is principal of Yudelson Associates, a sustainable design, research and consulting firm located in Tucson, Arizona, www.greenbuildconsult.com and cofounder of the largest green building trade show in the US, *Greenbuild*. The U.S. Green Building Council named him in 2011 to the inaugural class of 34 LEED Fellows, a singular honor.

Ulf Meyer has taught in the U.S. at Kansas State University and the University of Nebraska, where he held the Hyde Chair of Excellence in 2010-2011. He is a partner at Ingenhoven Architects in Düsseldorf, Germany, considered one of the pioneers of sustainable architecture in Europe.

"Addressing the challenges of our time, Yudelson and Meyer identify the true leaders in sustainable building design. Using real performance data, they showcase and compare buildings which combine great design, environmental quality and sustainability, providing the guidance necessary for the next generation of sustainable building design. A must read for every architect and engineer!"

Thomas Auer, Transsolar Climate Engineering, Germany

"This is information we have all been waiting for; while offering a global overview of green buildings, it helps to unlock the truth about the real performance of sustainable commercial architecture."

Steffen Lehmann, School of Art, Architecture and Design,
University of South Australia

"Here, Yudelson and Meyer have identified global design exemplars that integrate architecture and context, economics and social responsibility, performance and aesthetics, demonstrating exciting solutions to meet the challenges of creating a more sustainable world."

Bruce Kuwabara, founding partner, Kuwabara Payne McKenna Blumberg
Architects and design architect for Manitoba Hydro Place, Canada

"Yudelson and Meyer's great achievement is the qualification of the quantitative and the quantification of the qualitative for the ecological commercial typology in architecture."

Martin Despang, School of Architecture, University of Hawaii

About the Authors

Jerry Yudelson, MS, MBA, PE, LEED Fellow, is the most published author in the green building space, having written twelve previous books since 2005. The US Green Building Council named him in 2011 to the inaugural class of thirty-four LEED Fellows, a singular honor. In 2001, he became one of the ten original national trainers for the LEED system, a position he held for eight years. He is the cofounder of the largest green building trade show in the USA, Greenbuild. Since 2006, Yudelson has been Principal of Yudelson Associates, a sustainable design, research, and consulting firm located in Tucson, Arizona (www.greenbuildconsult.com). He frequently keynotes green building and sustainable cities conferences in the USA and in many countries around the world. He holds civil and environmental engineering degrees from the California Institute of Technology and Harvard University, along with an MBA (with highest honors) from the University of Oregon. He lives in the Sonoran Desert bioregion in Arizona with his wife Jessica and Scottish terrier, Bodhi.

Professor Ulf Meyer, Dipl.-Ing., studied architecture at the Technical University (TU) of Berlin and the Illinois Institute of Technology in Chicago. After his graduation from TU Berlin with a master's degree in 1996, he became an architectural critic and writer for newspapers and magazines from around the world. He has published more than 1,000 articles and ten books, among them the bestselling book *Bauhaus Architecture*, published by Prestel of Munich. In 2001–2002 he worked for Shigeru Ban Architects in Tokyo, Japan, considered one of the pioneering architectural offices in the world for the use of sustainable materials in contemporary architecture. In 2004, Ulf received the prestigious German–American Arthur F. Burns Award and was the guest critic for the *San Francisco Chronicle* in San Francisco, California. Ulf has curated several architectural exhibitions in Germany, China, and the Netherlands. He has lectured at dozens of universities and cultural centers on four continents. He is a partner at Ingenhoven Architects in Düsseldorf, Germany, considered one of the pioneers of sustainable architecture in Europe. Professor Meyer has taught in the USA at Kansas State University and the University of Nebraska, where he held the Hyde Chair of Excellence in 2010–2011. He has traveled extensively in Europe, East Asia, and North America. He lives in Berlin, Germany, with his wife Mao and two young children.

Foreword

Fifteen years ago, if asked the question "What makes a building green?" most professionals in the building industry would have answered, "Bad taste in paint." Today, "green" is clearly identified with having fewer negative effects on the natural environment. Buildings, or rather human uses of buildings, impact the natural environment in a variety of ways, including contributing to anthropogenic climate change, habitat destruction, and pollution of water, air, and soil. To be green, a building must reduce or eliminate these impacts. Running along a scale from the greenish-gray of impact reduction to clear emerald of complete elimination are a wide variety of building practices and a market crowded with the variety certifications, targets, and codes that define what a "green" building is. The ultimate goal of being green is to be sustainable, e.g., to create buildings which either have no impact on or actually improve the inhabitability of the planet. A green building is, therefore, a building that makes progress toward being sustainable.

The appropriate type and pace of movement toward sustainability is defined differently by a number of different certification systems, which more and more require that buildings prove their performance. Most well known in the USA is the LEED system.[1] In terms of energy, LEED establishes performance levels above code minimums. Buildings achieve LEED certification based primarily on their potential and are intended to represent the upper 25 percent of the market in terms of environmental performance. However, LEED is justly criticized for not being based in whole or in part on actual performance. In response, LEED version 3 (begun in 2009) now requires that each project submit actual energy performance data for statistical purposes.

Started in 2005, the 2030 Challenge is a straightforward performance-based challenge to create buildings that drastically reduce energy use.[2] The challenge goal in 2005: 50 percent reduction in carbon emissions from the average building. Every five years, the challenge is increased by 10 percent, meaning that, by 2030, a building meeting this test would be carbon neutral.

The International Living Building Institute launched the Living Building Challenge (LBC) in 2006.[3] The LBC starts with the concept of "triple net zero" where a project generates all of its energy on site with renewable energy systems such as photovoltaics or wind, harvests all of its water from the precipitation that falls on the site, and treats all of the stormwater and sewage so that none leaves the site without being treated. Projects must demonstrate they meet all twenty program requirements by showing a full year of operating data.

Taken together, these ratings systems can present a confusing picture of how to measure green building performance. However, it appears that all rating systems are getting more ambitious and ultimately converging on buildings that have zero-net carbon emissions.

Under its Energy Performance in Buildings Directive, the European Union has required since 2010 that all member countries mandate that building owners provide energy-use data to all prospective renters, tenants and buyers.[4] However, as of the end of 2010, there was still far from universal compliance with this directive, and the EU is in the process of revising its standards to ensure full responsiveness by building owners. Typically, as in the case of the UK, energy-use data is measured against national averages and does not provide adequate methods to compare actual performance against predictions, especially for new buildings.

Predicting how certain levels of carbon-emissions reduction will affect climate change makes it easier to answer the question "How green is green enough?" Clearly, radical reductions in production of greenhouse gases will be necessary even to maintain considerable and dangerous levels of warming. According to climate researchers, to maintain CO_2 levels that would cause 3.6–4.3°F (2.0–2.4°C) in warming, we would have to reduce anthropogenic emissions of greenhouse gases across the board 50–85 percent lower than 2000 levels by 2050. What this number suggests is that emissions reductions must be dramatic and that measuring sustainability by actual building performance is essential to getting the job done.

We cannot judge a building as green unless we know how it performs. This does not require reducing a building merely to a single number such as EUI (energy use intensity or energy usage index), but it must include real data showing energy use, water use, human comfort, and other metrics. There are two primary reasons why post-occupancy verification of green measures is necessary:

1 We won't know if our efforts are working if we don't measure results, leading to wasted effort, money, and time. Green design can only be successful if the process is seen as a cycle moving through design to construction to assessment that improved the next design in the cycle.
2 Designers have become expert at "talking the talk," but if we don't "walk the walk," our clients will begin to see green as just another marketing scheme. Certifying an underperforming building as green understandably leads to cynicism and undermines the massive human effort that must be harnessed if we are to combat climate change and other environmental issues.

Collecting and evaluating building performance information, as Yudelson and Meyer have done for this book, presents many challenges, including privacy concerns, liability, time investment, data availability, and uncertainties about how to interpret the data. On some projects, the building owner who possesses the utility data may not want to share it with others. It is not hard to imagine that after an owner has invested money and time in constructing a "green" building, they might not want to share data that indicates the building is underperforming. Reluctance to share data for underperforming buildings is particularly unfortunate; failed "green" buildings are enormous opportunities for learning.

At other times, measuring building performance may happen or not simply because there is no clear party designated to perform the measurement. Post-occupancy studies take time (and money). Understanding building performance benefits owners, architects, and consultants, but unless there is a clear structure for who will pay for and own the results, collection and evaluation of data may not happen on any given project. A solution to this problem is for project teams to designate a person for this role, at the beginning of the project, as part of initial contract negotiations, whether a consultant, architect, or building manager.

While the only data needed to calculate the gross EUI of a building are utility bills and square footage, the data needed to understand how different building systems are interacting is often unavailable; our sub-metering practices have not caught up with our green innovations. For example, it may be unclear whether good performance in a building is due to lower plug loads or lower lighting loads, if lighting and plug loads are not metered separately. Adding in sub-metering at the project outset would sharpen the tools we have for building performance assessment.

Once data is collected, how is it interpreted? How can this knowledge help to improve design? Though adequate utility and building systems information may be available, the question of why a building is performing in a certain way is often difficult to answer with certainty, or without a large investment in time and effort. Also muddying the interpretation of building performance is human nature. Buildings don't inherently use energy: the occupants and their use of the building do. People with different habits, priorities, comfort levels, or preferences can use a carefully designed building in unanticipated ways. Sub-metering, for example, can separate plug loads from process loads and help in determining whether improvement efforts should focus on occupant behavior or building systems performance.

Understanding the obstacles to collecting and interpreting building data is important but shouldn't distract or discourage building professionals from diving in and attempting to learn from the performance of every building project. The project teams contributing to this book show that these issues can be overcome. Yudelson's and Meyer's effort to collect and document the stories of the world's greenest buildings as measured by performance is essential. Rather than judging these projects on the basis of certification among disparate systems, Yudelson and Meyer compare them against the same yardstick: energy and water performance. These projects represent successful team efforts that, when taken together, define best green building practices worldwide.

Alison G. Kwok
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Preface

Buildings and building operations account worldwide for about 40 percent of global anthropogenic carbon emissions, including construction, operations, renovation, supply, and maintenance. Consequently, the energy performance of buildings has received growing attention from government, business, and nongovernmental organizations over the past half-decade. Most people realize that global climate change can only be addressed by tackling the issue of energy performance of buildings, as we strive to build and rebuild more sustainable cities. In addition, many people realize that building energy performance can be substantially improved with relatively straightforward design, construction, and operational measures.

At the same time, there is growing appreciation for the extensive benefits offered by green buildings, which include attributes other than energy conservation, such as improved urban design, intelligent location, sustainable site practices, water conservation, materials and resources conservation, and indoor environmental quality.

For the past several years, there has been an ongoing debate about the real performance of green buildings, especially in terms of reductions in energy and water use. In particular, debate has centered on those projects, perhaps 25 percent of the total certified and measured green buildings, shown to be performing *worse* than predicted and, in some cases, worse than conventional buildings (i.e. those built to standard building or energy code requirements).

After all, if a project doesn't deliver substantial savings in energy use and carbon emissions, or in water use (an increasingly important concern worldwide), why call it a "green" building, no matter what its rating might be in a particular sustainable construction scoring system?

More recent research has shown that most LEED-certified US projects are delivering an average of about 35 to 45 percent energy savings, when compared with a baseline determined by the ASHRAE Standard 90.1 (either 2004 or 2007 versions).

Realizing that actual performance is the critical missing information for green building projects, we set out in 2010 to find this information and to put it into a particular context: *the world's greenest buildings.*

Established third-party green building rating systems first came into significant use in the mid-1990s and early 2000s in the USA, Canada, Australia, and the UK. Beginning about 2006, these systems began to gain increasing popularity in these countries, as hundreds, eventually thousands, of projects registered intent to participate in them. The oldest system, promulgated by the UK's Building Research Establishment (BRE), found widespread use primarily in that country, where the top rating was BREEAM Excellent, more recently Outstanding. The second-oldest system, Leadership in Energy and Environmental Design (LEED), developed and promoted by the US Green Building Council and now in use in more than 30,000 nonresidential projects in 130 countries, gives a top rating of Platinum to about 6 percent of total projects certified.

The Australian Green Star system (also used in New Zealand and South Africa) gives a top rating of 6-Star (World Excellence) to a handful of certified projects. Singapore, Japan, Hong Kong, Germany, France, and a handful of other countries created similar green building systems.

LEED was officially adopted (and adapted for local conditions) in Canada and India. However, at this time, LEED is the dominant system in global use. Chapter 3 describes in greater detail several of the more widely used rating systems.

For the authors, the salient fact in the universe of green building rating systems is that they are converging globally around similar issues, similar measurements, and similar weightings of relative importance among a number of environmental attributes, with energy use (and its attendant carbon emissions) as the largest single factor in each system. More than ninety countries have national green building councils (as of year-end 2011), so the issue of how the greenest buildings in the world are performing has become of greater global interest.

In this book, we define the "world's greenest buildings" in the following way. To make its way into this book, a building must satisfy the following conditions:

- have at least 50,000 sq ft (4,500 sq m) of conditioned floor space
- be a nonresidential typology
- be among the highest rated in a recognized national/international rating system (e.g., LEED Platinum)
- be willing to share a full year of energy-use data (and water use where available)[1]
- new construction, with operations beginning after September 30, 2003 (thus representing the sustainable design "state of the art" during the past decade)
- represent "very good to best results" in energy performance, based on local climate and building type (e.g., schools should use less energy than office buildings because of fewer hours of annual operations, whereas laboratories would use considerably more energy than offices because of significant ventilation requirements).

While these conditions are necessarily arbitrary, they do represent a good way to differentiate between projects that are relatively easier to make sustainable (e.g., smaller buildings and homes) and those that require substantially more resources, commitment, and excellence in execution to achieve outstanding green results.

As we proceeded with our research in 2010 and 2011, it became apparent that a number of recent projects (say, those completed after fall 2010) would naturally merit inclusion in this book but would not have a full year of operating data by the end of November 2011, generally our cutoff date for data to be used in this book. As a result, and recognizing that low-energy green design is a rapidly evolving art and practice, we decided to include eight of these projects at the end of the book in Chapter 9, as Projects to Watch.

One final note: we both appreciate good architecture! One of our aims in writing this book is to demonstrate that "über-green building," low energy use, and great architecture are not incompatible. To the contrary, we believe that good-to-great architecture is essential for sustainable design: unattractive buildings will not be as highly valued by owners, occupants, and the public.

We can all argue about defining "good architectural design" but without it the world would be a much poorer place. With it, we can have super green buildings, more each year even with zero-net energy use, that will provide inspiration for the sustainable transformation of the building design and construction industry that we strongly advocate.

We hope that this book represents a way station on the road to a sustainable future, one in which the goal of living lightly on the earth will become increasingly realized through the quintessential human activity: the built environment.

Jerry Yudelson and Ulf Meyer
Tucson, Arizona, USA and Berlin, Germany

Acknowledgments

This book exists because of the dedicated efforts of hundreds of architects, engineers, constructors, owners, developers, and many others who set out over the past decade to create a new world of great green buildings and, despite considerable obstacles, actually succeeded. To these building teams around the world, we all owe our profound gratitude.

We also thank specifically the many architects, engineers, builders, and building owners who responded with case-study information and who cooperated far more than we expected by providing detailed operating data, project information, and building photos. Their contribution is noted in specific case studies throughout the book. Those we interviewed for the book are noted in Appendix A.

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Thanks also to those who reviewed the book proposal and offered helpful suggestions along the way and to those who reviewed the manuscript. As always, any errors of omission or commission are ours alone.

There is one person to whom we owe a special acknowledgment; that person is Gretel Hakanson, with whom the senior author has now collaborated on ten books. She was consistently creative, persistent, and reliable in gathering information for this book. She conducted and transcribed many of the interviews for this book, provided initial drafts of many case studies, gathered photos and illustrations along with the required permissions, edited the manuscript, and performed myriad other tasks to see the book through to completion. Without her contribution, this book would not have seen the light of day in any reasonable time frame, or perhaps at all.

We also acknowledge research support from Jaimie Galayda, PhD, who helped us identify the universe of US and Canadian LEED Platinum projects that met our criteria and began the process of contacting building teams for information. We thank Alfonso Ponce of Deloitte France for contributing some of his research on green building rating systems worldwide, along with Meghan Sarkozi, a recent architectural graduate who prepared information describing some of the world's green building rating systems; Francisco J. Alvarado, a graduate student at the University of Arizona, for finding and translating information on a green building project in Chile; and Tim Winstanley, also a graduate student at the University of Arizona, for preparing data for publication. We thank Heidi Ziegler-Voll for the illustrations created especially for the book and for redrawing those that needed it; she is a frequent and imaginative contributor to a number of Yudelson's books.

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There is one group of people who are acknowledged in the book, and whose contributions to the book are enormous: the many architectural photographers, architects, and building owners who generously permitted us to use, without fees, the beautiful building and project photos you will see throughout the book. With no real budget for photography, their cooperation was essential to produce this work in the form you see it here. We thank them sincerely for their cooperation.

Finally, we offer profound gratitude to our wives, Jessica Stuart Yudelson and Mao Meyer, for their help and support of this project. A native Japanese speaker, Mao Meyer was helpful in locating and translating information about projects in Japan. As a native German speaker, Ulf Meyer accessed and translated a considerable body of material not easily accessible to a non-German-speaking audience. He also conducted interviews with two leading green German architects, Matthias Sauerbruch and Christoph Ingenhoven.

Jerry Yudelson and Ulf Meyer
Tucson, Arizona, USA and Berlin, Germany

Abbreviations

ABW	activity-based working
ADA	Americans with Disabilities Act
AIA	American Institute of Architects (USA)
ASU	Arizona State University
BD+C	Building Design and Construction (magazine)
BIOCHP	biofuel combined heat and power
BMS	building management system
BRE	Building Research Establishment (UK)
BTU	British Thermal Unit
CBECS	Commercial Building Energy Consumption Survey (published by the US Department of Energy/Energy Information Administration)
CCHP	combined cooling and heating power plant
CDN	Commercial Development Nordic
CFC	chlorofluorocarbon
CFD	computational fluid dynamics
CFM	cubic feet per minute
CHH	Center for Health and Healing
CHP	combined heat and power (plant)
COTE	Committee on the Environment (of the AIA)
Cx	Commissioning
DCV	demand-controlled ventilation
DGNB	Deutsche Gesellschaft für Nachhaltiges Bauen (Germany)
DGU	double-glazed units
DOAS	dedicated outside air system
EEWH	Energy, Ecology, Waste Reduction and Health (Taiwan)
ETFE	ethylene tetrafluoroethylene
EUI	energy use intensity *or* energy use index
FSC	Forest Stewardship Council
GBCA	Green Building Council of Australia
GBCs	Green Building Councils
GHG	greenhouse gases
GRIHA	Green Rating for Integrated Habitat Assessment (India)
GWP	global warming potential
HCFC	hydrochlorofluorocarbons
HP	horsepower
HVAC	heating, ventilation, and air conditioning
kl	kiloliter
kBTU/kBtu	thousands of BTU
KW	kilowatt (power)

kWh	kilowatt-hour (energy)
IAQ	indoor air quality
IDP	integrated design process
IEQ	Indoor Environmental Quality (LEED system)
LCA	life-cycle assessment
$LCCO_2$	life-cycle carbon dioxide
LEED	Leadership in Energy and Environmental Design (from USGBC)
LTES	long-term energy storage
MBR	membrane bioreactor
MEP	mechanical, electrical, and plumbing
NABERS	National Australian Built Environment Rating System
NCKU	National Cheng Kung University (Taiwan)
NLA	net lettable area
NPV	net present value
ODP	ozone depletion potential
PEFC	Programme for the Endorsement of Forest Certification (Switzerland)
RFP	Request for Proposal
RFQ	Request for Qualifications
TCES	Tahoe Center for Environmental Sciences
TES	thermal energy storage
UBC	University of British Columbia (Canada)
UGB	urban growth boundary
USGBC	United States Green Building Council
VAV	variable air volume
VOC	volatile organic compound
ZONE	zero-net energy

Introduction

Form Follows Performance

Ulf Meyer

In the late nineteenth century, the debate in architectural circles revolved around the question whether architecture should use "natural" or "artistic" shapes, whether architecture was "the art of building" or "the art of space making," and whether "form should follow function." It was the German art historian August Schmarsow who finally untied the Gordian knot of this debate: Architectural shapes should neither follow nature nor art, he proclaimed, they are a derivative of performance requirements or expectations. Schmarsow's thinking was about 100 years early. Now, his thinking looks like the hottest thing since sliced bread—or REVIT, to use architecture speak.

Because the situation in the year 2012 is this: Everybody and everything is labeled as "sustainable" or "green," so these adjectives have completely lost any meaning. Regardless of this over-use, their precise meaning is still vague. Architects simply claim to design green buildings and that is it. Are they really green? If so, how and why? These questions barely get raised—let alone answered. Is incompetence or active lying at the base of widespread greenwashing—and which would be worse? Formidable careers in the profession and in academia depend on the lack of curiosity. Contemporary architects can become stars simply by claiming that they make "green" architecture look "sexy" and not "hippie." That makes it acceptable, even desirable in a capitalist mass-consumption society with a short attention span and a guilt complex.

The rating systems of the world first tried to find a common ground for the different endeavors and a way to make them comparable. Whether some have morphed into being more part of the problem than part of the solution, I leave that judgment up to the reader. If the word "sustainable" is passé, then which word do we use? How about "lasting"? Or "solid"? Hmm, less sexy, I admit, but more sustainable than "sustainable" I hope?

Coming from Germany, I was first pleasantly surprised, then shocked, then increasingly angry, when people from all over the world kept telling me how much they admired German building codes and the "advanced German take on sustainability." Who does not like to hear such compliments about their profession back home and who would not be tempted to try to take on the role of a messiah who would spread the teaching of the advanced Germans to the "under-developed Anglo-Saxon world"? Well, I don't.

Because the more I studied and taught the subject the more convinced I became that the no-nonsense things I had known already as a child were more true than anything I have ever heard at any green building conference anywhere in the world: That gray is the new green. We are on the wrong track if we think that we can "make the world a better place," if only our building consumes say 30 percent less energy. But, you may ask, "30 percent of what?" Despite the fact that we as a society do not manage to save energy at large, even if we did, we would still be in trouble. Is being "30 percent less polluting" really not the same as maintaining 70 percent of our clearly unsustainable pollution levels?

I.1 Green building is all about creating green spaces for both people and planet. Photo: G. Löhnert, sol·id·ar planungswerkstatt Berlin.

These relative numbers drive me crazy. It reminds me of the TV commercials for shampoo and skin care. They also claim to make the "hair up to 30 percent softer" or reduce the signs of ageing in our face "by 40 percent." So, should we just continue as if nothing happened? Of course not! But we should resist the temptation to feel good and brag about our little mini-achievements. If the rating systems contribute to the understanding that "green" design needs a big budget or is something that only an elite can achieve, then clearly they contribute to the problem more than to its solution.

Schmarsow knew it already: Performance drives design. Just as a square sailboat will not win the next America's Cup, architecture should "go with the flow" of performance-driven design. During my three years of teaching "sustainable architecture and design" at two different universities in the USA, my most memorable experience happened outside the classroom. My family (wife, daughter, and myself) decided to not buy a car, move downtown, and bike to the grocery shop. Boy, did we earn sympathy! When strangers saw us loading our milk crates onto the bikes, they would approach us with troubled faces, slap on our shoulders, and ask "are you OK?" We thought we were OK, but these things are not. If even in a small college town biking to the market makes a great story for the local newspaper, then clearly something is wrong. My educated academic colleagues of course had more balanced views. They thought that what we did was great and were terribly sorry that they could not do it the same way, because they lived "too far away from downtown." Well, these poor souls! The Communist Party of the USA must have assigned them a faraway suburban home. What I am trying to say is this, and it is very simple: Changes in density, bike paths, public transport, you name it, won't happen without demand—our demand that is. Yours!

Sustainability is not and never should be a matter of technology or gadgets or features. Its success is decided by urban design policy, choice of durable materials, willingness to invest in a building rather than in an electricity bill, and other factors that are way beyond the measures and tools of any rating system. The "age of good intentions" is over and I am happy about that. Now, show me your energy bill from last year and how it is lower than the one from the prior year. And stop slapping my shoulder and feeling sorry for me, please!

Ulf Meyer, Berlin