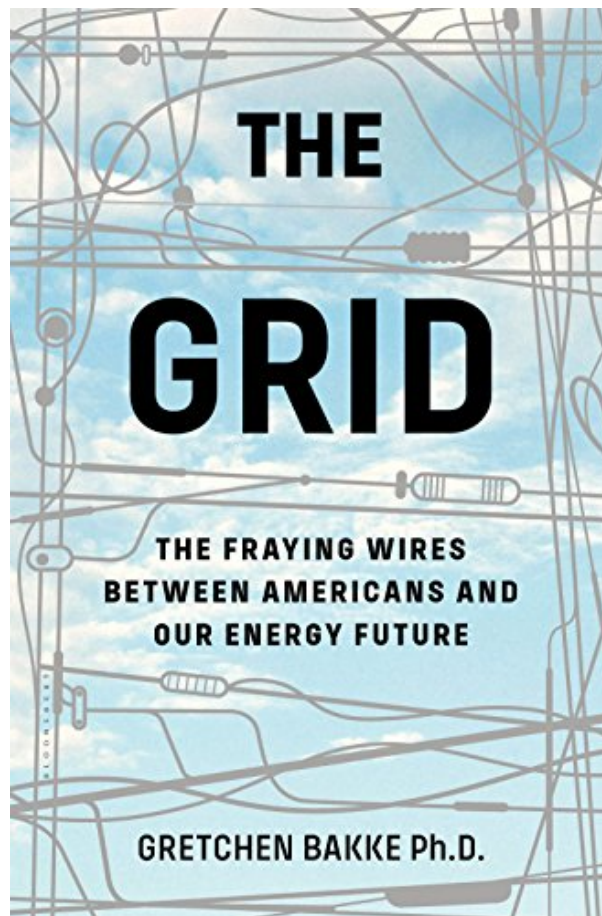
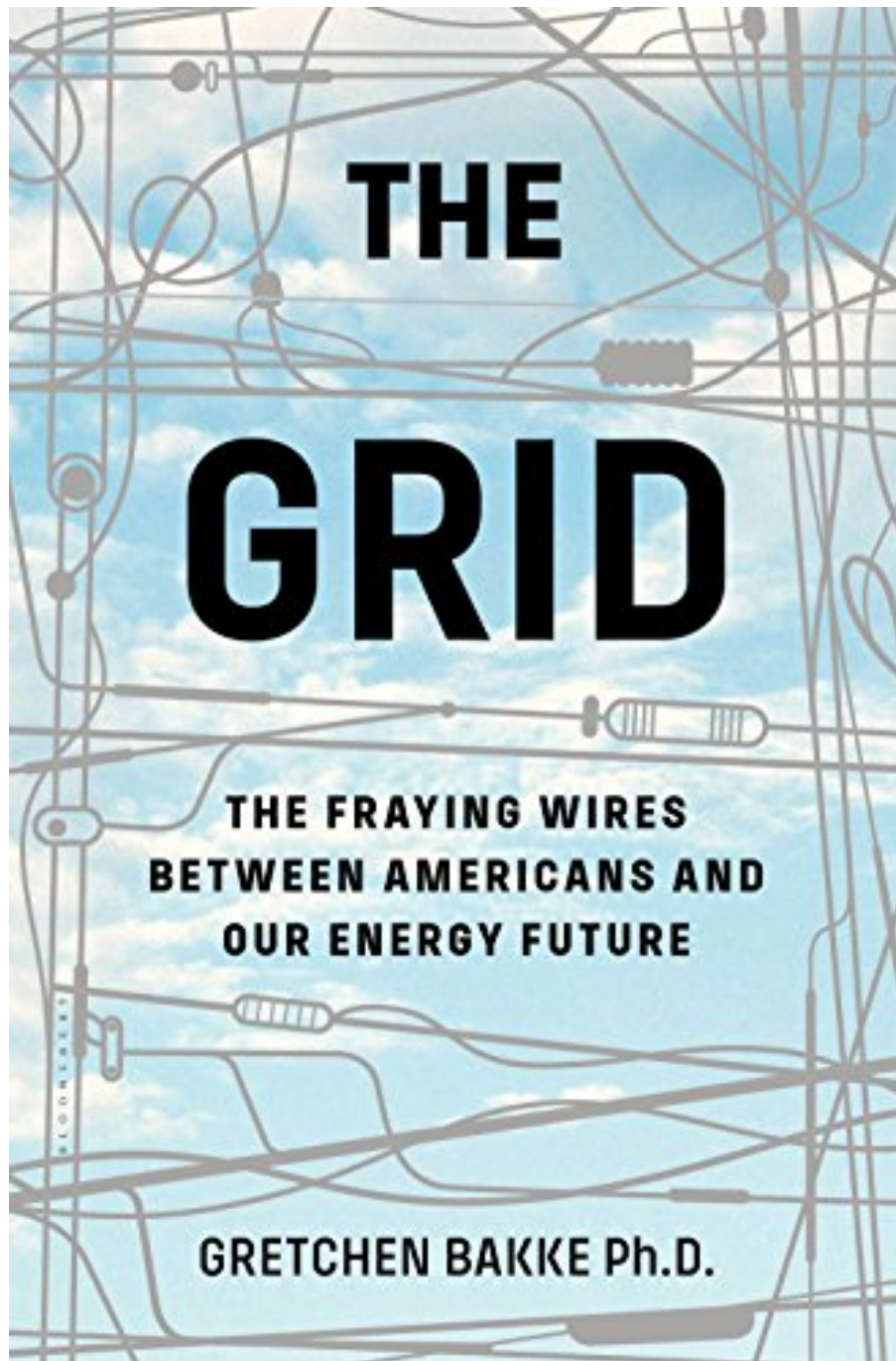


**THE GRID: THE FRAYING WIRES  
BETWEEN AMERICANS AND OUR ENERGY  
FUTURE BY GRETCHEN BAKKE PH.D.**



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## **PDF**

### **The Grid: The Fraying Wires Between Americans And Our Energy Future By Gretchen Bakke Ph.D.**

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"A remarkable achievement. Bakke deftly shows us how a system most of us are happy to ignore--the electrical grid--is both inseparable from everything we think of as civilization and on the verge of complete failure." - Paul Roberts, author of *THE END OF OIL* and *THE IMPULSE SOCIETY*

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#### About the Author

Gretchen Bakke holds a Ph.D. from the University of Chicago in Cultural Anthropology. She has done research on several failing nations, including the Soviet Union, the former Yugoslavia, and Cuba. She is a former fellow in Wesleyan University's Science in Society Program and currently an assistant professor of anthropology at McGill University. Born in Portland, Oregon, Bakke lives in Montreal and calls Washington, D.C. home when she's in the United States.

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America's electrical grid, an engineering triumph of the twentieth century, is turning out to be a poor fit for the present. It's not just that the grid has grown old and is now in dire need of basic repair. Today, as we invest great hope in new energy sources--solar, wind, and other alternatives--the grid is what stands most firmly in the way of a brighter energy future. If we hope to realize this future, we need to re-imagine the grid according to twenty-first-century values. It's a project which forces visionaries to work with bureaucrats, legislators with storm-flattened communities, moneymen with hippies, and the left with the right. And though it might not yet be obvious, this revolution is already well under way.

Cultural anthropologist Gretchen Bakke unveils the many facets of America's energy infrastructure, its most dynamic moments and its most stable ones, and its essential role in personal and national life. The grid, she argues, is an essentially American artifact, one which developed with us: a product of bold expansion, the occasional foolhardy vision, some genius technologies, and constant improvisation. Most of all, her focus is on how Americans are changing the grid right now, sometimes with gumption and big dreams and sometimes with legislation or the brandishing of guns.

The Grid tells--entertainingly, perceptively--the story of what has been called "the largest machine in the world": its fascinating history, its problematic present, and its potential role in a brighter, cleaner future.

- Sales Rank: #6032 in Books
- Published on: 2016-07-26
- Released on: 2016-07-26
- Original language: English
- Number of items: 1
- Dimensions: 9.59" h x 34.92" w x 6.49" l, 1.00 pounds
- Binding: Hardcover
- 384 pages

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#### Most helpful customer reviews

8 of 8 people found the following review helpful.

Insightful but Verbose

By Book Shark

*The Grid: The Fraying Wires Between Americans and Our Energy Future* by Gretchen Bakke

"*The Grid*" is an insightful yet verbose book on America's grid technology; it's history together with the laws, people and logic that brought it into existence. Author Gretchen Bakke holds a Ph.D. in cultural anthropology and is currently a professor at McGill University in Montreal, Quebec, Canada brings us this seldom told story of the evolution of an essential infrastructure. This interesting 364-page book includes the following nine chapters: 1. *The Way of the Wind*, 2. *How the Grid Got Its Wires*, 3. *The Consolidation of Power*, 4. *The Cardigan Path*, 5. *Things Fall Apart*, 6. *Two Birds, One Stone*, 7. *A Tale of Two Storms*, 8. *In Search of the Holy Grail*, and 9. *American Zeitgeist*.

#### Positives:

1. A well-researched, accessible book.
2. The seldom-told story of our electrical-grid infrastructure.
3. Does a good job of describing the grid and its problems. "America has the highest number of outage minutes of any developed nation—coming in at about six hours per year, not including blackouts caused by extreme weather or other "acts of God," of which there were 679 between 2003 and 2012. Compare this with

Korea at 16 outage minutes a year, Italy at 51 minutes, Germany at 15, and Japan at 11.” Bonus, “This is our grid in a nutshell: it is a complex just-in-time system for making, and almost instantaneously delivering, a standardized electrical current everywhere at once.”

4. Explains the most common causes of power outages. “Overgrown foliage is the number one cause of power outages in America in the twenty-first century.”

5. Shares interesting findings. “National security was threatened more by the “brittleness” of America’s electrical grid than by possible future disruptions in the flow of imported oil.”

6. One of the most interesting topics covered has to do with the problems of integrating renewables into the existing grid. This is a recurring topic in the book. “The problem is that renewable energy adds unprecedented levels of stress to a grid designed for the previous century.”

7. Key discoveries behind the grid. “This subtle-seeming transition in the structure of circuitry, from serial to parallel, was the grid’s first revolution. Though we tend to give Thomas Alva Edison the credit for having invented the lightbulb (he did not), he did devise something just as remarkable—the parallel circuit, one of his greatest if least lauded contributions to technological underpinnings of our modern world.”

8. The key steps to big grids. “The first step toward a big grid, one that would make it possible to universalize access to electric power, was the invention and successful manufacture of alternating current (AC) electrical systems in 1887.”

9. Discusses the history of big electrical business. “By 1925 almost nobody in the electricity business could even imagine a system for making, transmitting, distributing, or managing electric power other than as a monopoly enterprise.”

10. An interesting look at electrical efficiency. “By the mid-1960s it had become clear to utility men that a plant run at just over 30 percent efficiency was both the most reliable and the most cost-effective way to make electricity.”

11. A look at President Carter’s impact on energy. “This turn toward conservation and energy efficiency was the first crisis, of three, that would shock the electric utilities during the Carter era.”

12. A look at the wind industry. “The combination of federal and California incentives and innovative state regulations launched the wind industry in the U.S.”

13. Blackouts and their causes. “A case in point: On August 14, 2003, eighteen months after Davis-Besse was shut down for repair, the largest blackout in our nation’s history, and the third-largest ever in the world, swept across the eastern half of the United States and parts of Canada, blacking out eight states and 50 million people for two days. So thorough and so vast was this cascading blackout that it shows as a visible dip on America’s GDP for that year. The blackout, which covered 93,000 square miles, accounted for \$6 billion of lost business revenue. If ever it was in doubt, the 2003 blackout proved that at its core America’s economy is inexorably, indubitably electric.” Bonus, “In the case of the 2003 blackout the error on the grid took the form of overgrown trees and the error on the computers took the form of a line of code that disallowed simultaneous incoming data reports.”

14. Financial challenges of the electric industry. “Historically, utilities made money when people used electricity; the more we used the more money they made. Now they don’t. Today’s utilities make money by transporting power and by trading it as a commodity.”

15. A look at “smart grids”. “The “smart” grid uses computers to alleviate the abiding problem of peak load.”

16. Find out the impact of climate change to the grid.

17. A look at the impact of major storms to the grid. “After Superstorm Sandy, the Northeast began to witness the return of the tiny grid. These new constructions bear a lot in common with Edison-era private plants, which generated customized electricity for a single owner on-site. Unlike Edison’s private plants, these modern microgrids can connect and unconnect as needed to the big grid (which is now increasingly known as the “macrogrid”). And, unlike any system since the consolidation of power in the early twentieth century, these microgrids work perfectly well in “island” mode.”

18. Military applications. “Anything that can be done to eliminate the necessity of diesel generators, and reduce the amount of oil necessary to feed them on the field of battle, strengthens—adds resiliency,

flexibility, and mobility to—the war effort. Mobile, matte, lightweight, and diversified systems for keeping the lights on, the data safe, and the troops cool are critical to mission success. For while some of this fuel is poured into gas tanks, a lot of it is used to make electricity.” Bonus, “As a result, the DoD, which operates a fleet of 200,000 nontactical vehicles, is working to convert them all to electricity with vehicle-to-grid technologies designed in from the start.”

19. The “holy grail” of electricity, storage. “Today the grail is less a new way to make power than it is to find a really good way to store it.”

20. The future of the grid. In the final chapter, the author discusses the consumers’ personal interactions with power that may shape the grid of the future.

21. Plenty of links in the notes section.

Negatives:

1. Verbose. It could and probably should have been a hundred pages fewer.

2. Lack of supplementary visual material that could have done wonders to complement the narrative. The general public knows very little about how electricity works and this kind of book begs for diagrams and visual material, yet there is very little here.

3. Not only does the book lack visual material it lacks supplementary material that would of have been of interest to the public. As an example: maps of key grids, table of electrical consumption around the country, timelines, charts and diagrams showing the use of renewables versus non-renewable energy sources, etc.

4. Not only verbose but at times even tedious to read.

5. Missed opportunities to “shock” the reader with interesting tidbits or curiosities.

6. Lacks scientific rigor, the book is intended for the masses.

7. No formal bibliography.

In summary, this book should have been much better. The topic of the grid is personally interesting to an engineer like myself but I’m very disappointed on how verbose and poorly presented the material was. The lack of supplementary materials did the book no favors either. On the other hand, I agree with the findings and conclusions of the author and I did learn a lot about the electric grid as an essential and pervasive infrastructure. More like a 3.5-star quality book, if you are interested in the grid by all means read this book but you just need to be patient with it. A mild recommendation.

Further recommendations: “Living on the Grid” by William L. Thompson, “Empires of Light: Edison, Tesla, Westinghouse, and the Race to Electrify the World” by Jill Jonnes, “AC/DC: The Savage Tale of the First Standards War” by Tom McNichol, “Faraday, Maxwell, and the Electromagnetic Field: How Two Men Revolutionized Physics” by Nancy Forbes and Basil Mahon, “The Man Who Changed Everything: The Life of James Clerk Maxwell” by Basil Mahon, “The Electric Life of Michael Faraday” by Alan Hirshfeld, and “Tesla” by W. Bernard Carlson.

10 of 10 people found the following review helpful.

The Grid: more than just generators, wires and poles

By H Katz

A PhD in cultural anthropology might seem like an odd background for someone writing a book about our national electricity grid. But Gretchen Bakke sees the grid as more than just generating plants, transmission towers, wires, substations, poles, meters, outlets and cords. In her view any discussion of the grid has to include business models, government regulations, energy politics and the public’s changing desires and expectations – all of which really are cultural.

The Grid isn’t without its flaws. If you’re looking for a deeply scientific or technical understanding of the grid you’ll probably be disappointed by this book. Also the narrative does jump around a bit and there’s

repetition of some key points.

Overall, though, I really enjoyed this book. Like most people, I suppose I take electricity for granted ... until it's not there. I now have a much better appreciation for what it takes to keep the lights on. The Grid is fascinating and sometimes quite alarming. The overlapping technical, financial and social perspectives in the book provide an important picture of the incredible complexities of the grid, the daunting challenges we face in upgrading it, and the opportunities within our grasp to develop something better.

Full review at: [...]

36 of 40 people found the following review helpful.

Too much and too little

By Jack Pepper

I bought this book based on an engaging interview with Ms Bakke I heard on NPR. I had hoped her book would be as engaging. It is not. Her book rambles covering the material in too many words that never seem to get to the point. Even the scant illustrations impart no knowledge, for example exhibiting direct current as two adjacent rectangles and parallel current as one rectangle above another. At 20% through her book, I decided to jump ahead, but found the chapter headings opaque as to their content and gave up. What a shame, this topic has so much potential which is why I gave it a third star.

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