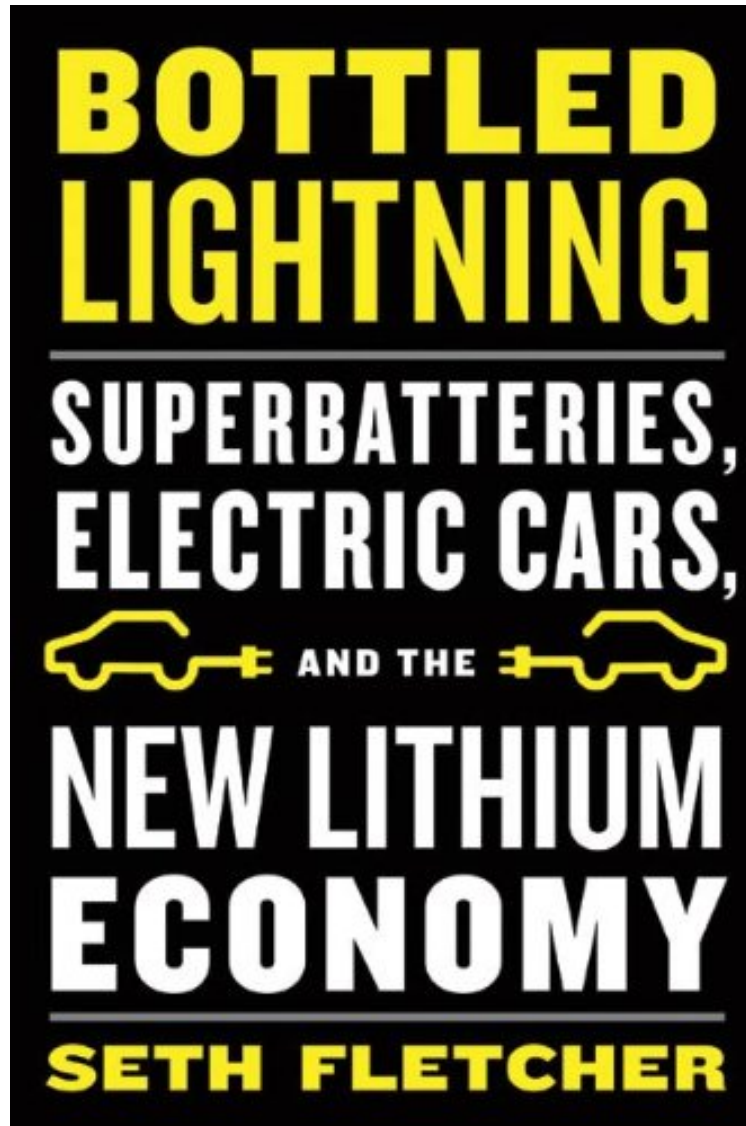


(Download pdf) Bottled Lightning: Superbatteries, Electric Cars, and the New Lithium Economy

Bottled Lightning: Superbatteries, Electric Cars, and the New Lithium Economy

Seth Fletcher

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Seth Fletcher : Bottled Lightning: Superbatteries, Electric Cars, and the New Lithium Economy before purchasing it in order to gauge whether or not it would be worth my time, and all praised Bottled Lightning: Superbatteries, Electric Cars, and the New Lithium Economy:

0 of 0 people found the following review helpful. This is a fun read, but won't make you an expert on lithium battery tech. By Bill Henderson Jr. The book follows the history of battery development leading to the lithium batteries for modern electric vehicles. He has some interesting insights into lithium reserves which I haven't seen in other books

about the topic. The book is from 2011 so it focuses a lot on the new for 2011 Chevy Volt. Unfortunately, I don't think there are any books that cover electric vehicles as of 2017. The bulk of the book covers history prior to 2011 so it's still relevant. If you read *Powerhouse* by Steve Levine *The Powerhouse: America, China, and the Great Battery War*, *Bottled Lightning* features some of the same players so it's familiar territory. If you only read one of the two books, pick this one. Fletcher's journalistic writing style makes it easy and enjoyable reading but you won't walk away from this an expert in the technology. Definitely recommended if you enjoy books about energy. 25 of 26 people found the following review helpful. A comprehensive account of the development of battery technology that made the modern electric car viable. By Emc2 Comprehensive, very well-written, and reads fluidly. As the title suggest, the book's focus is on rechargeable battery technologies and how the development of lithium-ion batteries made possible the launch of the first mass market electric cars in more than 100 years. The book scope covers events until around January 2011, right after the market launch of the Chevrolet Volt and the Nissan Leaf in the United States, so it is one of the most updated books on this subject. Be aware that at some points Mr. Fletcher gets carried away with technical explanations regarding how the different battery technologies work or describing battery chemistry or production processes, and thus, some basic to intermediate knowledge of chemistry and physics comes very handy. Nevertheless, the layman can safely skip these paragraphs without missing the main storyline; you just need to know that there are technologies A, B or C, and chemicals L, K and M. The book provides a brief historical overview from the discovery of electricity, to the invention of the battery to its widespread use at the beginning of the automobile age, when one third of automobiles were electrically-powered. Here Mr. Fletcher pressed pause and explains in more detail key developments in battery technology, Edison efforts for a better battery and his discovery of the potential of lithium, until the electric car demise due to the invention of the electric self-starter and widespread adoption of the internal combustion engine. A few chapters ahead, he completes the history of the evolution of the electric car and the barriers that hindered its success (not surprisingly most are the same as today). The book then present the different uses of lithium in a nutshell, including medicinal ones, and then Fletcher jumps in time to describe the developments of the last fifty years, beginning with all the maladies associated to the gas-powered automobile (tailpipe emissions and city smog, oil prices, national security, etc.). And here the book turns into a detailed account of the development of the rechargeable batteries used in mobile electronics, beginning with cellular phones through laptops up to the iPods, and the key roles played by Michael Stanley Whittingham and John Bannister Goodenough, whom the book implicitly praise as the fathers of the lithium-ion battery. The historical account of the development of modern rechargeable batteries ends with the ongoing patent wars among the companies doing the latest developments and commercialization of lithium-ion batteries. The book also presents in detail the story of General Motors competition to choose its partner and battery cell supplier for the Chevrolet Volt, and how it ended as a competition among two strains of lithium-ion battery chemistry. I have to confess that now I am convinced the Volt development meant a real technological breakthrough. I particularly enjoyed the chapters dealing with global lithium reserves and production; it is quite comprehensive and presents all the points of view. Mr. Fletcher provides a very realistic perspective and all the facts about the myth of "peak lithium" and also about the exaggerated worries regarding national security concerns regarding lithium supply (changing oil dependence for lithium dependence). The Bolivian and Chilean cases are presented in great detail, with enough historical background and his on site experience to let the reader understand how come their huge lithium reserves (Salar de Uyuni and Salar de Atacama) are separated by just a few hundred kilometers but each country has a completely different approach on how to explore their lithium and benefit their peoples. Despite the good global coverage of the lithium battery development and technologies, the book's presentation of the electric cars available in the market today is pretty American centric, as Mr. Fletcher focuses mainly on the Chevy Volt's development, a bit on the short-lived tzero, and on the Tesla Roadster. There are occasional mentions to the Nissan Leaf, and just one to the Mitsubishi i MiEV near the end of the book. Highly recommended for electric car fans but remember that the book focus is on the battery technology not so much about the electric cars, though the Chevy Volt is one of the book's main characters. For those interested in a detailed account of the Volt development, do not miss Larry Edsall's *Chevrolet Volt: Charging into the Future*. PS: Also, do not miss the recently published *High Voltage: The Fast Track to Plug In the Auto Industry* by green car journalist Jim Motavalli. 3 of 3 people found the following review helpful. Good news for the transition to electric mobility. By William Ferree Read this book to gain an understanding of one of the key technologies that is making the transition away from fossil fuels feasible, higher performance batteries. Fletcher is a senior editor for *Popular Science* magazine, and his story is delivered at that level of scientific sophistication, accurate but accessible. There is reason for optimism here. Lithium based batteries have the capability to store and deliver energy sufficient and at a low enough cost to make practical a range of devices, from smartphones to electric cars, that just weren't possible with earlier battery chemistries just a decade or so ago. This is good news delivered in an enjoyable book.

The sleek electronic tools that have become so ubiquitous—laptops, iPods, eReaders, and smart phones—are all powered by lithium batteries. Chances are you've got some lithium on your person right now. But aside from powering a mobile twenty first-century lifestyle, the third element on the periodic table may also hold the key to an environmentally sustainable, oil-independent future. From electric cars to a "smart" power grid that can actually store

electricity, letting us harness the powers of the sun and the wind and use them when we need them, lithium is a metal half as dense as water, created in the first minutes after the Big Bang and found primarily in some of the most uninhabitable places on earth; it is the key to setting us on a path toward a low-carbon energy future. It's also shifting the geopolitical chessboard in profound ways. In *Bottled Lightning*, the science reporter Seth Fletcher takes us on a fascinating journey, from the salt flats of Bolivia to the labs of MIT and Stanford, from the turmoil at GM to cutting-edge lithium-ion battery start-ups, introducing us to the key players and ideas in an industry with the power to reshape the world. Lithium is the thread that ties together many key stories of our time: the environmental movement; the American auto industry, staking its revival on the electrification of cars and trucks; the struggle between first-world countries in need of natural resources and the impoverished countries where those resources are found; and the overwhelming popularity of the portable, Internet-connected gadgets that are changing the way we communicate. With nearly limitless possibilities, the promise of lithium offers new hope to a foundering American economy desperately searching for a green-tech boom to revive it.

From *Publishers Weekly*: Electric cars are real; see the Tesla Roadster, Chevy Volt, and hybrids like the Nissan Leaf and Toyota Prius; but the drive to create safe, lightweight, and long-lasting batteries to power them has been anything but smooth. Faced with political, technological, and management obstacles, battery technology still lags. In the mid-1800s Fletcher says, clean, cheap lead-acid batteries were developed that by the early 20th century were preferred for use in automobiles over "unreliable, complicated, loud, and dirty" gasoline-powered cars; until it came time to refuel. Thomas Edison tried to invent a safe, longer-duration battery, even experimenting with small amounts of lithium, but then Charles Kettering patented an automatic starter for gas engines, and the battle was lost. Smog and 1970s gas shortages revived interest in electric cars; and lithium batteries. But obstacles remain: Bolivia, Chile, and China have less than optimal political leadership and minimal infrastructure to safely mine and process the poisonous ore. More importantly, many technical challenges must be overcome before electric cars and buses become everyday modes of transportation. But Fletcher remains optimistic. He balances science and history with a closeup look at business practices and priorities, providing lucid and thorough coverage of a timely topic. (May) (c) Copyright PWxyz, LLC. All rights reserved. [Fletcher] follows lithium from the South American salt flats where most lithium minerals are mined to the labs of General Motors, tracing its journey from obscure metal to one of the most sought-after resources on earth; and perhaps the centerpiece of the automotive future. Discover